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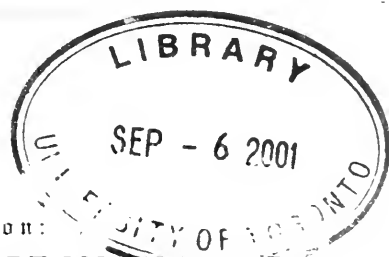
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LIST OF PLATES.

	TO FACE PAGE
PLATES. TO ILLUSTRATE DR. A. LOGAN TURNER AND MR. F. E. REYNOLDS' PAPER	74
PLATES. TO ILLUSTRATE MR. J. S. FRASER AND MR. F. E. REYNOLDS' PAPER ON OZENA	174, 176, 177

ILLUSTRATIONS IN TEXT.

	PAGE
TO ILLUSTRATE M. GEORGES MAHU'S PAPER ON PETRO-MASTOID EXCAVATION, ETC.	6, 7
AN INSTRUMENT FOR SUBMUCOUS RESECTION OF THE NASAL SEPTUM. J. H. PINDER	168
TO ILLUSTRATE DR. GUSTAVE BRÜHL'S PAPER ON OTOSCLEROSIS	296-297
TO ILLUSTRATE DR. NEIL MACLAY'S PAPER ON ENDOTHELIOMA OF NASAL BONE	302
A SIMPLIFIED ASEPTIC MACKENZIE GUILLOTINE. BY MR. H. E. JONES	335
A SIMPLE NASAL SPECULUM. BY DR. JAMES DONELAN	504
TO ILLUSTRATE DR. DUNDAS GRANT'S PAPER ON THE TREATMENT OF TUBERCULOSIS OF THE LARYNX	564, 568, 570
TO ILLUSTRATE DR. WATSON-WILLIAMS' PAPER ON THE TREATMENT OF TUBERCULOSIS OF THE LARYNX	576, 579, 581
TO ILLUSTRATE MR. SECComBE HETT'S PAPER ON THE TREATMENT OF TUBERCULOSIS OF THE LARYNX	586, 587, 588, 589
TO ILLUSTRATE DR. WATSON-WILLIAMS' PAPER ON THE INFLUENCE OF THE UPPER AIR-TRACT ON RESPIRATION	620

THE

JOURNAL OF LARYNGOLOGY,
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PARTIAL PETRO-MASTOID EXCAVATION WITH PRESERVATION OF THE TYMPANIC MEMBRANE AND OSSICLES.

BY GEORGES MAHU (Paris).

Translated by MACLEOD YEARSLEY, F.R.C.S.,
Senior Surgeon to the Royal Ear Hospital.

By partial petro-mastoid excavation must be understood, not the simple antrotomy such as is practised in the course of acute mastoiditis, but an operation comprising the resection of all diseased parts of the apophysis and of the bridge over the aditus, that is to say, every part of the operation done for the radical cure of otorrhœa except the last, removal of the ossicles and of the tympanic membrane. This preservation of the elements of the middle ear having for its object the conservation of the hearing, it must evidently be admitted that this hearing is not reduced to zero in the otorrhœics whom it concerns, and who alone form the object of this study.

It is sometimes a very delicate matter to come to the decision in such a circumstance: (1) Is it necessary to operate? (2) What operation should be done? Complete or partial excavation? In order to attempt a reply to these questions, it is necessary to divide non-deaf otorrhœics into two categories: those in whom the only symptom is the purulent discharge, and those, on the

contrary, who show disturbing signs, making us fear labyrinthine or cerebral complications. With these latter patients we have, so to speak, our hands forced, and we must scrupulously practise an extensive excavation, having for its object the placing of the patient out of danger, thus relegating the question of hearing to a secondary place. With simple otorrhœics, on the other hand, we have generally the leisure to reflect longer on the question and the duty of more completely elucidating it.

From the very first no patient of this kind should be operated upon without careful treatment of the tympanum and attic having been patiently tried by the meatal route. Without going further back than Jacod (1), of Lyons, who, basing himself on a report of Körner to the German Otological Society in June, 1908, and on the statistics of Scheibe, claims that otorrhœa without complications can always be cured by treatment applied through the natural passages, on condition that they are treated long enough by sufficiently expert hands, we think we ought to join with those authors in trying to react against the abuses which have occurred of late years from premature petro-mastoid excavation. In a work of Botey (2) recently published on the question now occupying us, we read that "the older an otorrhœa is the more localised are its lesions." Nothing is more true in our opinion, and experience has always confirmed this fact. Sometimes the lesions are limited to the tympanum and attic, at other times they are localised in the antrum and the limitrophic cells. Moreover, we are really obliged to admit this fact, for were it otherwise, that is to say, if the lesions always extended gradually over all parts of the petrous, we should inevitably see, in every old otorrhœa, symptoms appear, warning us that the infection had penetrated into dangerous regions. This is far from being clinically exact, since some people carry an otorrhœa from early infancy up to death without dying of the affection.

But in the presence of an existing otorrhœa, without mastoid, labyrinthine, or cerebral symptoms, we are most often incapable of stating precisely whether the lesions are out of reach—in the aditus or in the antrum; or whether, on the contrary, they can be touched and attended to by such a route, often no doubt narrow, as a drum-perforation, or even a simple fistula of Shrapnell's membrane. It is only in treating these lesions gradually, from the more superficial to the deeper parts, that it will be possible, after a certain time and within certain limits, to determine their seat by elimination. In these cases numerous methods of treatment are applied,

often different in form, but all based on the same principles. After disinfection of the meatus, and ablation, if they exist, of granulations growing on the edges of the perforation or issuing from the tympanum through this perforation, prolonged lavage of the attic is practised with Hartmann's cannula, and various antiseptics are applied, which one does one's best to direct to the diseased parts. Siebenmann, as did Bezold, simply insufflates powdered boric acid with Hartmann's cannula. Personally we are accustomed to proceed as follows: After having made the patient use, morning and evening, ear baths lasting seven to eight minutes of peroxide of hydrogen (pure to twelve volumes), attic lavage is performed thrice weekly with the Hartmann cannula and a rubber-ball syringe containing peroxide of hydrogen twelve volumes, diluted with twice its volume of tepid boiled water. This lavage is practised patiently for four or five minutes, but gently to avoid vertigo, varying the direction of the stream. After lavage the meatus and the interior of the cavity are carefully dried with small absorbent cotton-wool tampons mounted on probes of a convenient curve. The cavity thus dried is then painted with similar small tampons of cotton-wool impregnated with a solution of chromic acid in distilled water, 1 in 50. Removal is effected, if needed, of the excess of chromic acid coming away by the perforation, and the auditory meatus is stopped with a tampon of sterilised cotton-wool. According to the improvement obtained, these dressings are continued a longer or shorter time, suspending them if necessary. Sometimes the cure is effected in two or three weeks. At other times it is much more prolonged, and one has to contend with several relapses. Be that as it may, this procedure often gives satisfaction, and we have in this way cured numerous patients, of whom some have been shown to the Société de Laryngologie et d'Otologie of Paris. If, however, these attempts remain fruitless, if the discharge persists, or if relapses occur a great number of times, it is necessary to induce the patient to undergo a more important operation.

When the hearing is retained in part, when the ear is still *useful*, it should not be a question of suggesting to him the removal of the ossicles as a half measure, since in this case the operation will be certain to diminish his auditory acuity, without it being certain to remove his infirmity altogether. We should therefore at once propose petro-mastoid excavation. But if this latter intervention gives a certainty of a radical cure of his otorrhœa, it also leads to a loss of the hearing which remains. It is here that

the opportunity of the partial operation comes in, which, preserving the hearing, has already been praised by several authors. Ch. Heath (3) considers it a duty to respect the membrana tympani and ossicles when they exist. Urbantschitsch (4) has published a case in which the hearing for the watch improved from 2 to 20 cm. R. Botey (5) makes it a rule to practise this intervention in all cases where the hearing is preserved on the diseased side (low voice perceived at 1 metre), even when granulations are growing from the attic walls or the ossicles. Logan Turner (6) reports two cases, aged thirty-four and twenty-three, of otorrhœics from infancy, in whom he practised incomplete excavation with preservation of the tympanic membrane and ossicles. In the course of the operation, the attic wall having been fractured accidentally, he removed it, taking care not to displace the incus. The discharge disappeared, with the pain and headaches; in one of the patients the hearing remained unchanged, and in the other it became better than before the operation. Bondy (7) has also tried this conservative operation in four cases, and his efforts have been crowned with success. Bárány (8) has shown to the Austrian Society of Otology a case of excavation with preservation of the membrane and ossicles. It was a case of cholesteatoma extending into the attic and antrum, but in which, the tympanic membrane being preserved, the hearing remained good. MacCuen Smith (9) (of Philadelphia) has done this operation several times, following the method of Heath, but he was later obliged to complete the radical cure. He nevertheless advises the conservative operation in children.

One opportunity offered itself, too tempting for us to resist the desire of trying to make one of our patients profit by the advantages of this method. This trial, moreover, succeeded, as is shown by the following:

CASE 1.—M. C. —, aged fifty-four, first seen June 8, 1909. Left otorrhœa for more than twenty years. Thick and fetid pus formed waxy masses, which the patient removed with a handkerchief. Deafness, headaches, and vertigo were complained of. On examination we could at first see only a big, brownish, semi-solid plug, which we extracted at the time. This plug was formed of inspissated pus, which appeared to issue, not especially through the tympanic membrane, which showed only a narrow perforation behind the handle of the malleus, but from a large bony fistula situated in the posterior part of the meatus, external to the tympanic ring, and above on the side of the mastoid antrum. After treatment for a month with baths of peroxide of hydrogen and applications of the 1 in 50 solution of chromic acid the discharge dried up, the perforation closed, and the hearing improved considerably, the loud voice being perceived perfectly during conversation and the low voice being heard at sixty centimetres. Rinne positive. Matters

remained thus for nearly a year. On March 1, 1910, suppuration reappeared, profuse and fetid; the mastoid cavity was considerably enlarged, but the tympanic membrane showed no more trace of perforation; the patient complained anew of vertigo and headache. We then decided to operate as soon as possible and to practise the petro-mastoid excavation. But, in view of the completely repaired tympanic membrane and of good hearing, we felt some scruples, and wished to try and preserve the membrane and ossicles. After having opened the antrum by Schwartz's method, the apophysis, diseased throughout, was resected in its entirety. The antrum and aditus were filled with granulations. We removed the bridge above this latter cavity, which we everted as deeply as the level of its junction with the attic, of which the open orifice allowed the exit of granulations. With the greatest care we avoided wounding the membrana tympani and the tympanic ring, but we removed the attic wall, which showed several foci of osteitis. In the presence of such extensive bony lesions we left the operation cavity open behind, after having completely resected the posterior meatal wall, already greatly damaged by the large breach which existed before the operation. The dressings were analogous to those following an ordinary opening of the mastoid. The tympanic membrane remained intact, while, during the first days which followed the operation, a slight purulent discharge continued to show itself at the level of the communication of the attic with the aditus. This infection, treated by applications of tincture of iodine, disappeared before the finish of the dressings at the end of about three weeks. The hearing was better than before the operation—the low voice was heard at one metre. No further signs of vertigo or headache.

Emboldened by this success, I recommended an operation of the same kind in another case nearly similar, that I met with one month later:

CASE 2.—Mme. L—, aged thirty-two. Left otorrhœa two years. Enormous polypus almost emerging at the outlet of the auditory meatus. After snaring this polypus it was discovered that its pedicle issued through a fairly large fistula in the posterior superior meatal wall, well in front of the tympanic membrane. A probe introduced into this fistula penetrated to a depth of 1 cm., and one felt with its point a nest of granulations on the mastoid side. Thick fetid pus came in abundance from the orifice of this fistula. A perforation of Shrapnell's membrane was seen, but on this side the infection did not seem to be very active, for the purulent discharge was insignificant. After conservative treatment for several months by the meatus we succeeded in drying up the discharge from the tympanum, but not that from the antrum. It was then that we decided to operate, and matters went as in the preceding case, save as regards the outer attic wall, which could be preserved. The retro-auricular wound was closed immediately after the operation and the autoplasty done by Siebenmann's method. As to the hearing it did not alter. The low voice, perceived at half a metre before the operation, was the same after the cure.

REMARKS ON THE TECHNIQUE OF THE OPERATION.

After having opened the antrum and enlarged the cavity so obtained to the shape of a funnel, the aditus is found and its direction ascertained by introducing into the canal a small probe. Then, engaging the beak of the protector in the entrance, one begins to transform this tunnel into a well-widened trench. And

afterwards one proceeds gradually by following the guide of the aditus with the beak of the Stacke's protector, as if one wished to

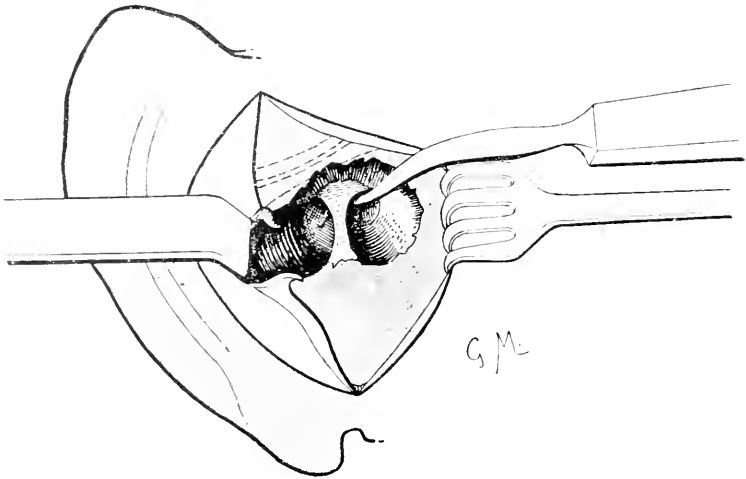


FIG. 1.—The beak of the protector, engaged in the aditus, is at its extreme position.

make the ordinary petro-mastoid excavation. The aditus and the attic, forming in their entirety a canal in an arc of a circle with its concavity inferior, at the commencement of the introduction of the

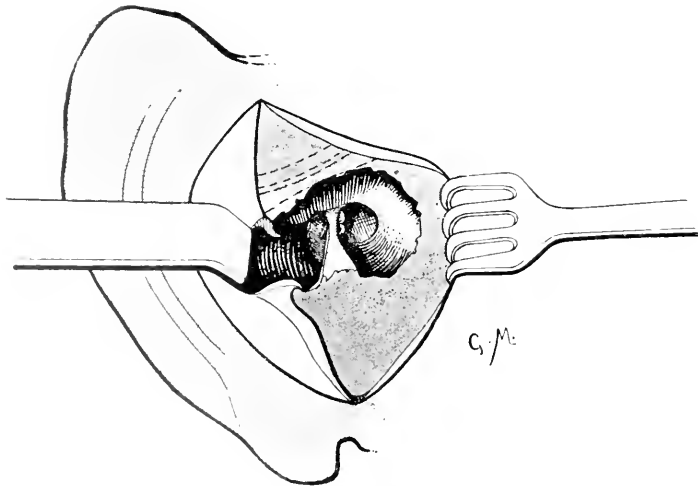


FIG. 2.—Partial excavation. The outer attic wall has been partly preserved.

protector its beak is directed towards the upper part, and, consequently, its handle towards the lower. In proportion as one advances in the formation of the trench, the handle is brought

more and more horizontal. It is when it has reached this position (Fig. 1) that one must stop uncovering the aditus, for at this

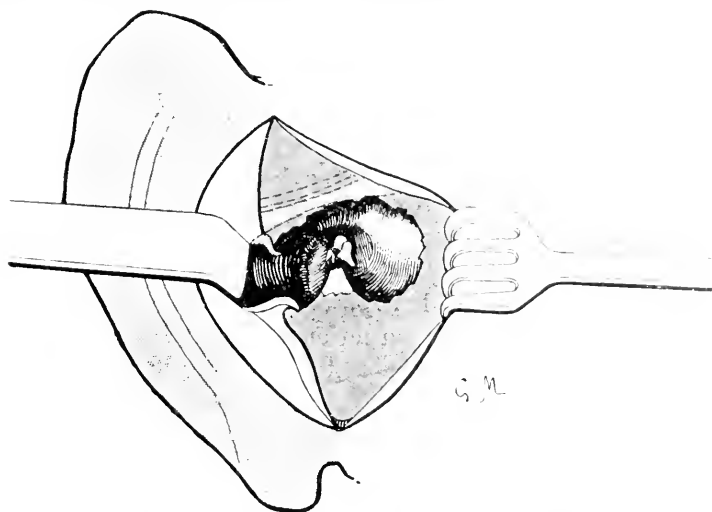


FIG. 3.—Partial excavation. The outer attic wall has been removed.

moment the attic is reached. If the ascending movement of the handle of the protector is continued in allowing oneself to be

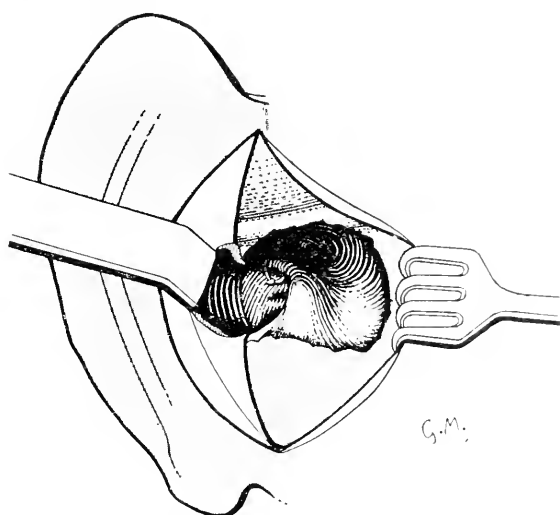


FIG. 4.—Complete petro-mastoid excavation.

guided by the position of the beak in the canal, this beak will be found to be in the attic itself; it will strike against and tend to displace the ossicles, and one will be compelled to remove the outer

wall of this cavity, that is to say, the wall of the attic. This is what one must try to avoid if this wall is healthy, as it constitutes, before as after the operation, a protective wall for the ossicles. Nevertheless, the preservation of the attic wall does not appear to be absolutely indispensable, since, in imitation of certain authors, we have removed it in one of our cases without its appearing to cause any inconvenience. Whether one respects the attic wall or not, this step of the operation is none the less most delicate. Indeed, it is difficult not to break through this extremely fine bony lamella, if one wishes to preserve it; on the other hand, if one removes it, it is necessary to avoid, at all costs, striking the head of the malleus or the horizontal process of the incus, which are uncovered. During the execution of this part of the operation the tympanic membrane will be protected by a cotton-wool tampon or by a small wick of sterilised gauze. The posterior bony meatal wall having been resected, all the cavities thus hollowed out are widened, and the results shown in Figs. 2 and 3 are obtained, which may be compared with Fig. 4, reproducing the appearance of the complete petro-mastoid excavation.

In order to be able to superintend closely the progress of repair in the course of the dressings, the retro-auricular orifice will be allowed to remain as long as the dressings continue; or, if this orifice is closed immediately after the operation, an autoplactic procedure will be employed allowing of the preservation of a large window in the side of the meatus—those of Botey or of Siebenmann, for example.

REMARKS.

In the presence of the satisfactory results obtained, one might try to employ this method in all cases of otorrhœa where the middle ear remains useful. On the contrary, however, we think that it is necessary to be extremely circumspect, and this for several reasons: (1) The possibility of relapse and, in consequence, the necessity of having recourse to a supplementary operation, which it is always disagreeable to propose to the patient. (2) The danger in not finding out soon enough certain lesions in the parts preserved, especially on the side of the attic roof and of the labyrinth.

It is true that if an infected focus exists in the interior of the tympanum, we should be generally made aware of it either by the ordinary symptoms of an acute median otitis on the side of the tympanic membrane, or by a persistent discharge occurring

from the opening of communication between the attic and the aditus. The supervision of the membrana tympani is easy. It will be the same with that of the opening of communication if one is careful to take the precautions indicated above. As to that concerning the labyrinth, it should be the object of the most attentive supervision if, after a similar operation, the least appearances of relapse are observed. We have seen such catastrophes blaze out in certain cases of incomplete operations on the skull that we consider that it is impossible to observe too great an attention.

W. G. Porter (10) reports the case of an otorrhœic with excellent hearing (whisper = 18 ft.), in whom a complete radical cure had to be performed, because the great part of the lesion (cholesteatoma) had its seat in the attic and tympanum. The hearing was, nevertheless, entirely preserved. This case is in no way astonishing, for the simple fact of the *presence* of the incus and the malleus does not suffice to make the middle ear useful; it is necessary, further, for these ossicles to preserve their *mobility*. If, for example, the lesions of adhesive otitis exist involving the tympanic membrane, the malleus, and the incus, and if, on the other hand, the stapes has preserved its mobility, it is evident that this latter ossicle alone is useful and that the two others, as also the tympanic membrane, may be suppressed without inconvenience to the hearing. It must be said, with Neumann (11) and Frey (12), that the preservation of the ossicular chain is of importance, from the point of view of audition, only when the stapedia articulation is intact.

Sohier Bryant (13) (of New York) remarks that, in the course of the radical cure, the examination of the tympanum will indicate whether one can preserve the stapes, the neighbouring parts of the tympanic membrane, and sometimes the ossicular chain. He considers that the conductive apparatus should be saved as much as possible. Leidler (14) thinks that the employment of this method is contra-indicated in the case of cholesteatoma. Further, on account of the adhesive processes which may occur, he believes it wise to wait for six months after operation before passing judgment on the definite state of the hearing. Ruttin (15) is not hindered by these inconveniences, because, according to him, it is always possible to contend with these adhesive processes, and he considers that, when the hearing for the voice reaches two metres, the conservative operation is indicated. Hammerschlag (16) finds this operation risky, since it may compel, in certain cases, the performance of a secondary operation. He thinks, notwithstanding, that it is always indicated when the opposite ear is defective. It

cannot be denied that the ossicular chain, when its articulations are functioning, is of great use for the perception of sounds, and particularly of deep sounds. This fact has, moreover, been demonstrated experimentally by Schäfer and Sessow (17) (of Berlin), who have made experiments on patients excavated on both sides; in these patients the perception of high sounds remained good, but that of low sounds was defective. Lermoyez is of opinion that partial excavation should be tried (1) when the tympanum is healthy, the membrana tympani cured, and aërial hearing good on the affected side; (2) when, the opposite ear being completely deaf, the affected ear has kept a certain degree of *aërial* hearing, even when there is pus in the affected tympanum. On the contrary he is of opinion that this operation should never be performed, whatever may be the otoscopic appearances, when the labyrinthine hearing is defective on the affected side. Politzer (18) objects to this operation as not removing all the diseased focus. According to observations taken from his clinic, suppuration has persisted a long time or there have been relapses. It is, according to him, contra-indicated in cholesteatoma, granulations in the tympanum, and in cases of large perforation of the membrane. It is indicated when the audition has remained good, and when the preservation of the hearing plays an important part in the condition in the social position of the patient, and when there is no vital indication for the radical.

CONCLUSIONS.

It appears to be conclusive that the petro-mastoid excavation conservative of the tympanic membrane and the ossicles may be performed in a sufficiently large number of non-deaf otorrhœics, well selected from the otoscopic and hearing points of view, even when the tympanum may not be absolutely intact, but provided that they fulfil the following conditions: No serious destructive lesions of the tympanum and attic; no cholesteatoma; no labyrinthine disturbances; good aërial hearing; Rinne positive; Gellé positive. It is particularly indicated if the subject is very young or is deaf in the opposite ear.

It includes all the steps of the complete petro-mastoid exenteration save the last—suppression of the ossicles and the remains of the tympanic membrane. The preservation of the attic wall is optional, according to the case. After the operation an active supervision of the operation cavity and of the labyrinth is indis-

pensable, particularly during the dressings. According to the nature of the lesions the posterior wound may be closed immediately, using a large otoplastic method (that of Siebenmann, for example), or the retro-auricular opening may be left to close progressively.

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RETROSPECT OF LARYNGOLOGY.

During the past year we have had a large number of papers published dealing with special cases of interest, operative procedures and therapeutic measures. A careful perusal of the literature will show that the study of the affections of the larynx has not been neglected, and there are as many active workers as ever seriously engaged in the many problems that are yet to be solved.

While many interesting special cases of diseases of the larynx have been recorded, most attention has, as usual, been given to certain specific classes, because of the large number of patients affected and of the serious interests involved alike to the individual and the community. For example, as usual, tubercular affections of the larynx present some of the oldest and most serious problems with which the laryngologist has to deal. Notwithstanding the benefits to be derived from treatment in the sanatorium or on similar lines at home, or by rest to the voice, or the many therapeutic agents which are now employed, everyone feels that there is much yet to be done. Prophylaxis in this affection, as in all other diseases, is best of all, but the fact remains that we have large numbers of cases still coming to our clinics or to the private consulting-room for which little can be done.

It cannot be said that, so far, tuberculin given in the most scientific way and controlled by the best methods of measuring the resistance of the tissues to the disease has been too encouraging. Surgical treatment, while giving unmistakable relief in some instances, has not done so much as the surgeon would have liked by way of cure. Improvements in the condition of certain individuals have been recorded by Dr. Dundas Grant and other observers by means of the galvano-puncture, and the same writer has shown cases where the injection of alcohol into or near the trunk of the superior laryngeal nerve has given much relief in severely painful cases. Notwithstanding all that has been done, however, a careful consideration of the literature of the past year impresses one most with the great necessity of further investigation and research.

Last year we called attention to the treatment of syphilitic disease of the throat and made special reference to the excellent papers on the subject by Dr. Lieven. In the opinion of that authority, mercury administered in certain ways remained the most important remedy. The treatment of the disease by arsenic was also fairly discussed by the same author. The year's further experience, however, has thrown considerable light upon the

subject, and every physician and surgeon is watching with interest the somewhat sensational and yet scientific researches of Professor Ehrlich with the now famous remedy "606," or to give it its full name, "dioxydiamidoarsenobenzol."

No one who has had experience of patients suffering from the terrible results of this affection in the larynx can fail to be interested in, and to hope for, the prevention of the conditions of stenosis due to cicatricial changes which have hitherto practically baffled all the surgeons in the past. To be able to prevent the formation of tertiary mischief in the larynx will be one of the greatest triumphs of the age. The drug up to date has been wholly administered by certain observers who can be trusted to carry out the clinical administration according to the regulations laid down by Professor Ehrlich. Of course, as Dr. Lieven pointed out last year, it takes many years before the profession can judge fully of the value of a drug, and it is too soon yet to speak of new remedies as being sufficiently potent to prevent relapses. In fact, recurrences have already been placed on record, there have been also fatal results in some weak subjects, especially amongst the young, and there have been doubts expressed owing to injury to the optic nerve and the production of other affections in the nervous system. Moreover, at the present time and especially in this country, practitioners have found some difficulty, apart from getting the drug, in having the necessary tests made before its administration. Where the serum can be got and the spirochaeta detected by microscopic examination matters are comparatively easy, but this test unfortunately cannot always be got. The Wassermann test can, of course, be applied, but in private practice it is not so easily obtained as the practitioner would desire and the expense is considerable. The pain attending the injection is a factor to be carefully considered, and, above all, the preparation of the solution is of the greatest importance. Severe irritation following a badly prepared solution may result in so much irritation locally as to prevent the full absorption of the drug. So much is this the case that intra-venous injection is being tried on the Continent.

Before long our knowledge of the drug and results will be very much increased, and it is to be hoped that the profession will soon be in possession of an agent which will, at least, have approximately a specific action on the organisms.

As usual, neoplasms of the larynx have received, as they deserved, a considerable amount of attention during the past year.

Even simple papillomata of the larynx are not easily commanded, as was shown by the opinions expressed by a number of surgeons in a discussion on the subject which followed a paper by Dr. Andrew Wylie at the Laryngological Section of the Royal Society of Medicine in March last. We know that many methods of treatment have been tried, including the local application of salicylic acid, the internal administration of arsenic, tracheotomy, thyrotomy, intra-laryngeal operation by the ordinary methods and by direct inspection; even the galvano-cautery in many cases has been tried, and notwithstanding all that has been done the general opinion of the profession seems to be that repeated removal is all that we can meantime do in obstinate cases.

Passing to the consideration of malignant disease one can only say that everything published during the past year tends to confirm the opinion that early diagnosis followed by early removal should be the first consideration. The results of the radical operation show that methods of technique have been improved, but even where the operation has been successful the comfort and prospect of life to the patients must be vastly increased if the local conditions be removed before the necessity arises for complete extirpation.

The whole subject was again carefully reviewed at the last International Congress of Medicine held at Budapest by such authorities as Sir Felix Semon, Chiari, Professor Gluck, of Berlin, and the papers read, as well as the discussion which followed, furnish the profession with an important expression of present views held by surgeons at this time.

Many of our readers will remember the important papers by Semon, Krause, Grossman and others upon paralysis of the recurrent laryngeal nerve, and if this year we have not so many articles upon the subject it has not been neglected, as is shown by the contribution by Dr. Jules Broeckaert communicated to the Section of Laryngology of the International Medical Congress of Budapest.

This writer passes in review recurrent paralyses of the cerebral origin, recurrent paralyses of the bulbar origin, and recurrent paralyses of the peripheral origin. He concludes that with regard to the first of these that "since even the most extensive destruction of the cerebral laryngeal centres only suppressed the voluntary movements of the vocal cords, leaving unaffected the reflex mobility, it is logical to conclude that absolute immobility of a vocal cord in the cadaveric position can on no account depend on

a cerebral lesion." Speaking of the second class of cases, he states that Semon's law, which sets forth that all acute or chronic affections in connection with the laryngo-motor tracts are to be accounted for at the very onset by the isolated affection of the adductor group, is very often in contradiction to the facts depending on bulbar lesions. In literature there are numerous observations of recurrent lesions of bulbar origin, in which it is noted that the constrictor muscles were alone affected. In dealing with the third class of cases due to peripheral origin the present views are subjected to a critical analysis, and all those interested in the subject may read with profit the translation published in the March number of this JOURNAL for last year.

A large number of papers have been published during the last year upon the removal of foreign bodies from the upper respiratory tract and œsophagus. Most of the papers and discussions upon them have had special reference to the newer and direct methods of inspection and operation. The value of X-rays in diagnosis and treatment has also been fully discussed. After the discussion which took place in Manchester, when Professor Killian gave his demonstration upon his new methods and Dr. Macintyre his results with X-ray photography and radiography, there was a tendency to some extent to look upon these as somewhat rival methods. It is now abundantly clear that far from this being the case they are complementary to each other, and although some surgeons still maintain that X-ray diagnosis may be misleading in certain instances, it has been pointed out that many of these errors might be overcome with stereoscopic pictures taken instead of the ordinary single picture so commonly employed.

Dr. Scanes Spicer, in continuation of his previous papers, has again given demonstrations by means of models, by which he illustrates his views upon the variations in the effect of costal and abdominal breathing on the stresses, strains, and friction in the throat and larynx, more especially of cricoid cartilage on the spinal column, and also the transverse axis of respiratory rotation of the cricoid on the thyroid cartilages. A variety of opinions was expressed in the discussion which followed, but inasmuch as the subject is one very much before the singing profession at the present moment, the suggestion of one of the speakers to the effect that the whole subject was of sufficient importance to justify the calling of a special meeting in order that it might be thoroughly dealt with might be profitably kept in mind. The whole question has given rise to so many discussions in the past that it is only

right every opportunity of arriving at a satisfactory conclusion should be given.

The very important subject of vaccine therapy has received very great attention during the past twelve months, and discussions have taken place in more than one centre upon its value in special affections of the upper respiratory tract. As might be expected, surgeons have expressed different views upon the benefits to be derived from this method of treatment. There is a growing conviction, however, that in certain catarrhal, suppurative, and pneumococcal conditions the results have not so far been as promising as could have been desired in acute cases. On the other hand, more favourable reports seem to be recorded of the benefits derived in the more or less chronic conditions.

Some observers, as a consequence of disappointment in the results obtained, are inclined to minimise the importance of the subject, and to rely more than ever upon ordinary treatment and operative procedures which will give free drainage to the parts affected. Of course, the latter remark applies more particularly to the cavities. On the other hand, some observers seem to be making the mistake of paying too little attention to the ordinary surgical procedures and have been relying too much upon the vaccine therapy itself. Judged from this standpoint, the surgeon ought not to rely upon the introduction of vaccine in the case of a patient suffering from pus in an accessory cavity of the nose or in the middle ear.

In the present state of our knowledge we cannot claim for this method of treatment a definite result in old-standing and recurrent affections of the upper respiratory tract. That seems to be the experience of those who have tried it in such conditions as bronchitis, although the patient may get a considerable amount of relief when recurrence takes place. There can be no doubt, however, that the whole question is engaging the attention of a large number of laryngologists, and many surgeons look most hopefully to the future of this method of treatment.

RETROSPECT OF RHINOLOGY.¹

It cannot be said that during the past year any very startling advances have been made in Rhinology, unless, indeed, we except the extra-nasal expansion in the direction of the pituitary body.

¹ The numbers in brackets refer to pages in the volume for 1910.

In fact, rhinologists in general may be considered to have been marking time, and have been striving, as we venture to think, towards a thoroughly rational and sane position in the happy mean between nihilism and excessive operative activity. There has been a decided tendency in the direction of the perfection of intra-nasal detail. Up to the present the accessory sinuses of the nose have been a never-failing hunting ground for the bold tyro, and the last word with regard to them has not yet been said, but a great deal has been said, and it remains in the future to judge as to the value of the work already done rather than add to it much that is new.

References to Nature rather than books or to the inner consciousness of the writer always call for our respect, and the investigations as to the relation between the sphenoidal sinuses and the sphenoido-ethmoidal cells by Syme (pp. 31, 78) go a long way in rectifying our views as to the anatomy of these parts. Side by side with this we may place Onodi's work on the oculo-orbital, intra-cranial, cerebral complications of diseases of the nasal accessory sinuses, which are studied and interpreted in the light of the examination of his enormous anatomical material (p. 332). We are indebted to him also for his tests as to the value of transillumination of the frontal sinuses as checked by radioscopy and the anatomical examination (p. 166), and it may be at once confessed—as long ago insisted upon by Logan Turner—that transillumination of the frontal sinus, pure and simple, is absolutely unreliable. The relations of the optic nerves and tracts to these sinuses have been frequently discussed by Onodi. He wisely points out that the existence of disturbance of vision and sinus disease may be simply co-incidental and arise from causes quite independent of each other, and, further, that the nasal disease which induces severe disturbance of vision may be extremely slight, while extensive nasal disease may cause no ocular disturbance whatever, much depending, of course, on the degree of thickness and porosity of the intervening parietes.

An interesting and often overlooked cause of rhinolalia aperta has been thoroughly worked up by Dr. Brown Kelly. We refer to insufficiency of the palate, and many will see cases of it now that their attention has been drawn to them by that author (pp. 281, 343). The influence of the nose on other organs has suffered from exaggeration by those who first studied it, but it is too important to be lost sight of; and Dr. Dan McKenzie adds another to the list of cases of asthma combated successfully

by nasal treatment (p. 202). The discussion in the Section of Laryngology of the British Medical Association brought out many important points. Dr. Francis found a lowering of the blood-pressure to result from cauterisation of the septal nerve, and he attributed to this factor some of the success which he claims for that method of treatment in asthma. Mr. Ernest Waggett, in opening a discussion on vaso-motor rhinitis (or rhinorrhœa), suggested, among other interesting points, that the condition of the blood was an important element, and thought his experience had confirmed his belief that salts of lime and magnesia were beneficial (p. 529). Dr. Pegler discussed the nerve-anatomy of headache of nasal origin (p. 544).

"Ozæna," though vastly less frequent than it used to be, is still with us. Baumgarten asserts that true ozæna—and probably many cases formerly labelled as such were not "true ozæna"—never makes its appearance after the tenth year. The age at which it first evolves is, therefore, in any given case an element of importance in regard to prognosis and to treatment. Möller (p. 547) found atmocansis beneficial in a hundred cases of ozæna, but it was always preceded by thorough cleansing with peroxide of hydrogen. In all of them the Wassermann reaction was negative. Caboche (p. 433) describes two cases of pronounced atrophic rhinitis with lupus in the nose in one and tuberculosis of the larynx and lungs in the other. This association is not very rare, and should be specially remembered in cases simulating "ozæna," but without fœtor. Foy recommends "re-education" in breathing with compressed air and oxygen (p. 432). Truly there is no lack of "something to do" in ozæna and atrophic rhinitis.

The bacteriology of suppuration in the accessory sinuses of the nose has been further studied by Logan Turner and Lewis in continuation of the previous investigations of Darling, but a very positive conclusion is arrived at, namely, that the *Streptococcus pyogenes* is particularly resistant to treatment by lavage, and that its presence is a strong indication for more radical proceedings (p. 434).

StClair Thomson reports a case of unilateral pan-sinusitis of four cavities being operated on at one sitting (p. 200). Guisez makes a statement that ethmoidal exenteration is the key to the effectual treatment of pan-sinusitis, this being carried out by means of opening the internal wall of the orbit and resecting the ascending process of the superior maxilla (p. 315). A case of fatal acute pneumococcic meningitis secondary to empyema of the

frontal sinus, with important conclusions as to its extremely dangerous nature, is recorded by Campbell and Rowland (p. 437).

The relations of the sphenoidal sinuses to the various nerves have been stated by Ziem, who gives a very valuable bibliography (p. 242). Hajek's case of mucocoele of the sphenoidal sinus causing optic neuritis, operation being followed by cure, will be read with great interest (p. 433). Numerous results from operation on the frontal sinus have been reported by, among others, Nourse (p. 197), Tilley (p. 191), and StClair Thomson (p. 308), but greater interest attaches to the possible risks as illustrated in two cases recorded by Hajek, in which the operation was followed by death from meningitis, neither of them presenting any special technical difficulties nor unusual gravity. He considers that if improvement, even without complete healing, is produced by endo-nasal treatment, as in the great majority of chronic cases, the radical operation is at the present time not indicated (p. 331). Inexperienced operators would do well to take note of these possibilities, but it is important that they should remember at the same time that intra-nasal manipulations in unaccustomed hands are also not devoid of danger. In children it is desirable to carry out treatment of suppuration in the antrum through the nose, as the alveolar operation is necessarily complicated and often excluded on account of the presence of the unerupted teeth. This has been dwelt upon by several British observers, but Wendling reports a case in which in a child of eight the empyema was caused by disease of the upper canine tooth, after the extraction of which the sinus could be washed out (p. 273).

With regard to operations on the nose and accessory sinuses, Denker's operation under local anaesthesia with novocain has greatly commended itself when radical treatment of the antrum is indicated (p. 420). The operation of submucous turbinectomy, which has been very strongly advocated here by Stuart-Low, receives great commendation from Zarniko (p. 425). There are cases in which the hypertrophy of the mucous membrane is inconsiderable, and the obstruction is chiefly due to excess of bone, and in these this operation is an ideal one. In nasal operations in general Polyak urges completion at one sitting (p. 418). There are numerous exceptions to this rule, the applicability of which depends on the features of the individual case.

Among the minor intra-nasal proceedings, which when purposively carried out have often the effect of turning the scales in the direction of recovery, we may note the resection of hyper-

trophies of the anterior lip of the hiatus semilunaris (the unciform process). Dundas Grant showed a case in which a most obstinate rhinitis subsided immediately after the removal of such a hypertrophy (p. 255).

The advance of trans-nasal surgery is illustrated by Kanavel's paper on the removal of tumours of the pituitary body (p. 222). Tumours of the sinuses are illustrated by Voss's case of sarcoma of the sphenoidal sinus (p. 436) and Manasse's one of exostosis and mucocele of the frontal sinus (p. 424).

Malignant disease of the nose and naso-pharynx is so insidious and misleading in its onset that every case deserves consideration. Some instructive and illustrative cases have been shown or narrated in our past volume. Among these may be noted those of Salzburg (p. 547), Price-Brown (p. 264), Luc (p. 314), Madden (p. 436), Law (p. 141), Dupond (p. 222), and Grant (p. 90).

Among the more important works published during the year we must note Dr. Watson Williams' "Text-book of Rhinology" (p. 445).

RETROSPECT OF OTOTOLOGY.

OF the many papers, articles, and discussions which appeared in the JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY during last year, there are several which merit special attention by reason of the novelty or originality which characterises them. Mr. Cheate's work on the influence of the infantile type of mastoid process upon the course of events in aural suppuration, for example, naturally occurs to us as worthy of inclusion in this category. His views have, no doubt, been familiar to our readers for several years, but in the volume just completed there will be found a fresh series of references to the subject in the papers read by him before the International Congress at Budapest and before the Otological Section of the Royal Society of Medicine. The discussions arising out of these papers show that Mr. Cheate's theories have obtained the support of many leading otologists (pp. 169, 205, 328). The second article to which we may allude as marking an advance in our knowledge, if its conclusions be confirmed, is that by Drs. Neumann and Ruttin (p. 612), in which, under the title of the "Ætiology of Acute Otitis," the rôle played by the *Streptococcus mucosus* in producing a special and dangerous type of middle-ear suppuration is for the first time fully recognised. Another novelty is furnished in Dr. Wyatt Wingrave's paper on the pathogenesis

of cholesteatoma (p. 339), the thesis of which was that the metaplasia of epithelium, upon which the production of cholesteatoma is said to depend, is the result of a process of desiccation. Dr. J. Ramsay Hunt, also, in his article upon the sensory symptomatology of the facial nerve (p. 405), has thrown a ray of light into a hitherto obscure corner of the field. In addition to his paper, a valuable amount of work upon the facial nerve has been published during the year. Drs. Bruee and Fraser (p. 293) have communicated an important article upon a case of facial paralysis combined with Ménière's symptoms, in which they secured microscopic sections of the internal ear and of the nerve-trunks. Cases of facial paralysis following catarrh and acute suppuration of the middle ear respectively were recorded by Dr. H. J. Davis and Dr. Munch (pp. 125, 260). In this connection also we may mention Mr. Sydenham's successful case of end-to-end suture of the nerve in its canal (p. 223). The subject of tumours interfering with the eighth pair of nerves is illustrated in cases reported by Dr. Jones (p. 110) and Dr. Starr (p. 444).

Adverting to those portions of the work in which formal debates upon topics of a wider scope afford us opportunities of observing the general trend of opinion, we may refer first of all to the discussion upon the labyrinth tests and their significance at the London meeting of the British Medical Association, appropriately introduced by the pioneer in this department, Dr. Bárány, of Vienna (p. 473). The mnemonic table of the tests devised by Dr. Adams, of Glasgow (p. 523), should be studied along with Dr. Bárány's remarks. Besides their use in suspected labyrinth suppuration the tests may also prove of value in the diagnosis of functional disorders of hearing (p. 372), and in this connection it will be remembered that two French observers, Drs. Lermoyez and Hautant (p. 427), advise the employment of the tests in the detection of malingering, for which, also, it may be noted in passing, Bárány has found his noise machine of service (p. 656).

A large number of cases of operation on the labyrinth have been reported, and among the papers which describe the operative procedure in detail those of Drs. Bourguet, Alexander, and Mr. C. E. West may be read with profit (pp. 402, 451, 473). References to the indications for operation are also frequent, but, as the several discussions show, nothing like general agreement upon this important matter has so far been reached. On the one hand, we are warned by cases like that of Dr. Luc (p. 614) of the danger of leaving a suppurating labyrinth undrained, while, on the other

hand, Dr. Alexander, a strong advocate of radical measures, has shown in a paper upon post-operative labyrinthitis that mild and evanescent attacks of the disease are not uncommon, and that they generally get well spontaneously and completely (p. 50).

The labyrinth having been disposed of, perhaps the next most prominent item on our list is that of deaf-mutism, of the pathology of which there is still much to be learned. In this department we are indebted to Dr. Albert Gray, of Glasgow (pp. 46, 525), for interesting information regarding the enlargement of the labyrinth spaces of certain deaf-mutes, and to Mr. Macleod Yearsley for having statistically demonstrated the frequency with which deaf-mutism is due to congenital syphilis (pp. 181, 234; see also pp. 329, 657, 658). Mr. Yearsley's conclusions receive independent support from Dr. O. Mayer's pathological researches upon the labyrinth of children who had died of the disease (p. 615). The mention of syphilis recalls to the mind the thorough survey of the ravages of the disease upon the auditory apparatus by Mr. Cheatle, President of the Otological Section, in introducing a discussion upon this subject (pp. 572, 643).

In addition to these general subjects, the association of the naso-pharynx and the ear has been emphasised in several articles, particularly in Dr. Law's two Presidential Addresses (pp. 34, 467), and in the case of epithelioma of the naso-pharynx shown by him before the Otological Section (p. 141). Several American authors, also have dealt with the same subject (pp. 103, 164, 316, 317), and it formed a portion of Mr. Mark Hovell's remarks upon affections of mucous membranes throughout the body (p. 526).

Most of the other publications may be divided into two classes: first, those dealing with diagnosis, and secondly, those dealing with treatment. Among the former we observe a criticism of Gellé's test by Dr. Bárány (p. 96), and a paper of Dr. Alexander's which raises the question of the reliability of the "fistula symptom" (p. 670). Dr. Bárány has been experimenting with some new hearing-tests (pp. 156, 656), the value of which is not yet quite evident, but his differentiation of cerebellar from labyrinthine ataxy occupies a very different position (p. 657). The utility of the cytological examination of ear-discharges was the topic of a paper and discussion in the American Laryngological, Rhinological, and Otological Society (p. 663), and on the same occasion, as well as in two papers by Lentert (pp. 50, 323), the examination of the blood was advocated as an aid in the diagnosis of serious complications of aural suppuration. A suggestion of which more will doubtless

be heard is that of Dr. Birkett and Dr. Schwarz of the X-ray examination of the temporal bone in suspected mastoiditis, etc. (pp. 472, 558). The fallibility of the means at our disposal for diagnosing brain abscess is a constantly recurring subject in otology, and we have published during the year instances of mistaken diagnosis for which we are indebted to Prof. Farrer, Mr. Hunter Tod, and others (pp. 325, 329, 375). In this connection we may allude to Mr. Whitehead's case of temporo-sphenoidal abscess in which vomiting was absent (p. 370).

Turning now to the subject of therapeutics, we find the value of ossiculectomy in suppuration of the middle ear judiciously examined by Mr. Macleod Yearsley (p. 523), and the employment of Bier's hyperæmic treatment of the same disease emphatically condemned by Drs. Biehl, Isemer, and Spira (pp. 107, 321, 414), because it tends to mask the presence of important danger-signals. Another method of treatment which has been found to be unavailing is that of lumbar puncture for aural vertigo (Dr. Weill, p. 257). The use of fibrolysin, recommended for the relief of certain forms of deafness, has been shown by Dr. Stocker to be occasionally fraught with danger (p. 225). On the other hand, we are able to point to one or two more promising methods of treatment. Bárány, for example, has ingeniously closed a fistulous opening into the labyrinth by filling it with lead. The vaccine treatment of aural suppuration has proved very successful in the hands of Dr. E. W. Nagle (p. 659), whose mode of preparing the vaccines should be carefully noted. Dr. Ruttin (p. 658) has alluded to the influence of posture in the treatment of middle-ear suppuration, a detail to which attention was called in England a few years ago. With regard to the operative treatment of purulent otitis, the omission of packing after the mastoid operation has been commended by Dr. Neubauer and others (p. 319). Operations on the jugular bulb are described in a paper by Dr. Moure, of Bordeaux (p. 388), and the still undecided question of ligaturing or not ligaturing the jugular vein in sinus phlebitis was debated at the International Congress (p. 416), and formed the theme of a paper by Dr. Botey (p. 327). The treatment of septic meningitis by drainage is discussed in several articles (pp. 441, 442, 502), and two cases of recovery from the disease have been reported by Dr. Logan Turner (p. 442). Dr. J. Stoddart Barr has put into practice the flushing out from the lateral ventricle of the sub-arachnoid spaces in meningitis, the possibility of which he had proved experimentally (p. 527).

Dr. J. Stoddart Barr also has continued his investigations into the occurrence of optic neuritis in otherwise uncomplicated aural suppuration (p. 334)—labours worthy of wider recognition than they seem to have hitherto received.

A thoughtful and exhaustive study of tuberculosis of the middle ear and temporal bone in children was laid before the Section of Otology of the British Medical Association by Dr. Milligan (p. 506). This paper and the discussion which followed it contained numerous suggestions as to its pathology, diagnosis, and treatment.

With reference to the external ear, a number of references to congenital defects of the auricle have appeared (pp. 94, 259, 417, 641), and an echo of a paper read at a former meeting of the British Medical Association upon exostoses of the external meatus was heard in the discussion upon this condition in the Otological Section (p. 374).

Finally, in the matter of rare cases, last year proved to be, perhaps, unusually prolific, objective tinnitus (pp. 39, 147, 214, 335), osteomyelitis of the mastoid process (p. 217), and post-operative perichondritis of the auricles (p. 375) being among the number. A case of retro-pharyngeal abscess from mastoid suppuration was reported by Dr. Fallas (p. 164), and an example of extra-dural abscess of the posterior fossa finding an outlet through the jugular foramen into the neck was described by Dr. H. J. Davis (p. 644). Another vagary of infection in the cerebellar fossa is exemplified in Mr. Sidney Scott's case of retro-cerebellar abscess (p. 649). A unique case of a mucous polyp in the pharyngeal orifice of the Eustachian tube was exhibited by Mr. J. A. Jones before the Otological Section.

It may, perhaps, be incorrect to include malignant disease of the ear among the rarities, seeing that Dr. Sheppard found three cases among 2000 patients (p. 597), but most otologists would probably agree that it could not be called common. During the year there have been published instances of all three varieties of the disease—epithelioma, sarcoma, and endothelioma—two cases of the last being reported, one by Dr. Dundas Grant (p. 143) and the other by Dr. D. R. Paterson (p. 220).

SOCIETIES' PROCEEDINGS.

PROCEEDINGS OF THE ROYAL SOCIETY OF
MEDICINE—LARYNGOLOGICAL SECTION.

Meeting on Friday, December 2, 1910.

DR. P. WATSON WILLIAMS, *President, in the Chair.*

Abstract report.

REPORT FROM MORBID GROWTHS COMMITTEE.

With reference to the case of cancer of the œsophagus shown by Dr. Hill at the last meeting, the Morbid Growths Committee reported that the section submitted to them showed no evidence of carcinoma.

Dr. HILL said that the pathologist to whom he had submitted a portion of the growth had expressed the view that he had no doubt of its being carcinoma. Clinically, the speaker added, the evidence in favour of carcinoma was indubitable.

Dr. PEGLER remarked that Dr. Shattock had seen the section examined by the Morbid Growths Committee, and agreed with their opinion.

The following cases, specimens, etc., were shown :

NUMEROUS COLOURED DRAWINGS AND DIAGRAMS AFTER QUAIN, LUSCHKA, ELSBERG, KILLIAN, AND ALSO DEMONSTRATIONS OF COLOURED LANTERN-SLIDES OF PHOTOGRAPHS OF FROZEN SECTIONS AFTER BRAUNE, ILLUSTRATING THE TOPOGRAPHICAL ANATOMY OF THE RIGID RESISTANCES OF THE LARYNX AND ADJACENT PARTS, SHOWN WITH OTHER SLIDES BEARING ON THE PROBLEM.

BY DR. SCANES SPICER.

A series of coloured and black-and-white engravings published (1885-1910) by British laryngologists (M. Mackenzie, F. Semon, L. Browne, P. McBride, P. Hutchinson, Watson Williams, and others), together with unpublished sketches from his own case-books bearing on the origin of cancer in the larynx, and numerous coloured drawings and diagrams after Quain, Luschka, Elsberg, and Killian relating thereto, were exhibited.

The object of this demonstration was to present some of the evidence available for the conclusion that the sites (*a*) of initiation,

(b) of maximum development, of laryngeal cancer are determined by the mechanical interaction of the rigid resistances of the laryngeal endo-skeleton on the one hand, and certain cell constituents (*e.g.* epithelial and fibrous) of the soft tissues (*e.g.* mucous membranes) on the other.

The larynx, from the ease with which it can be inspected, is peculiarly advantageous for the clinical study of the origin of internal cancer. It has the disadvantage that the laryngeal cancer is comparatively rare. In both these respects a marked contrast appears between the larynx and the stomach. According to the American mortality returns, in every 100 cancer deaths 43 are stomach to 1 larynx, while in the English in every 100 cancer deaths 21 are stomach to 1.8 larynx (Roger Williams). In the seventieth annual report of the Registrar-General for England and Wales the total number of deaths from larynx cancer per year (seven years' average) is only 313. Again, Sir Felix Semon's series of 246 cases took him over thirty years to collect, at the rate of eight per annum. As but few cases, then, were likely to be seen by any individual laryngologist at a sufficiently early stage to be watched throughout so as to test inductively the suggested causal relationship, it was the collective observation of many specialists directed to the point at issue that was required. This should soon confirm or disprove the alleged connection. Deductive reasoning on the observations actually made would be, however, pre-eminently necessary, since the real origin was but seldom on the *free* surface of the mucous membrane, as seen in the laryngoscope, but somewhere on its *deep* surface, and perhaps in a hidden laryngeal recess.

If in an animal with an endo-skeleton—*i.e.* a vertebrate—certain muscular actions were, from any cause, habitually exaggerated, the corresponding rigid resistances and soft tissues were reciprocally influenced in such a way as to cause undue stress, strain, or friction of those soft tissues—*i.e.* to produce a chronic, intrinsic, mechanical irritation of the latter. The result was, under certain conditions of nutrition, warmth, moisture, senescence, obsolescence, etc., to stimulate an excessive and disorderly growth of the epithelial, endothelial or connective-tissue cells entering into their structure.

The association of local irritations of extrinsic and palpable origin, such as the pressure of a clay pipe, rough tooth-plate, smoking, paraffin-soot, betel-chewing, Kangri stoves, and injury, with the starting of cancer is widely accepted.

The "sharp tooth" irritation cause of cancer formed a natural transition to the view now put forward that hitherto unsuspected intrinsic irritations were even more frequent and potent causes of the initiation of cancer, and this not only in the larynx, but throughout the body. The sites of preference for the commencement of cancer, whether in the gullet, stomach, intestinal flexures, rectum, breast, skin, uterus, etc., were found to be those sites at which the resultant of excessive mechanical forces chronically impinged or acted, and where, normally, there was no provision for escaping the consequences of such excess. This was seen if the springy joints, elastic lungs, and contractile muscles, which were little liable to primary cancer, were compared with such areas as the region of cricoid excursion, the œsophageal gastric junction and the rectum opposite the coccyx, where various rigid resistances and soft tissues underwent relative changes of stress and position with reference to each other with often excessive force.

The chief muscular mechanisms concerned in producing undue tissue stress, strain and friction were believed to be (1) the motor mechanism for maintaining equilibrium in posture, (2) that for respiration, and (3) that for digestion; but important factors arose in the relative displacements and mutual pressures of the internal movable organs constrained in part by mesenteries and ligaments, and also from the artificial compression of the trunk by corsets.

Faulty postures and mode of breathing in man, whether from habits, occupation, imitation, intestinal derangements, or other causes, brought about persistent portal congestion, intestinal stasis, and general auto-toxæmia. This was especially seen in marked types of belly-breathing, in which *habitual inspiratory descent* of the diaphragm took place, with *no* expansion of the base of the thorax by the muscular mechanism of respiration.

Such abnormal muscular action of the diaphragm tended to produce, simultaneously but independently, two things: (1) Abnormal increase of intrinsic mechanical strains and irritation, causing cell overgrowth at sites of impact or restraint—*e.g.* the inspiratory pulling down of the cricoid; (2) through relatively lessened thoracic suction chronic portal congestion occurred, leading to intestinal auto-toxæmia, general blood cachexia, and hence wasting of the tissues at large.

The central nervous system, through the deep afferents and visceromotoric reflexes, endeavoured to co-ordinate the motor mechanisms so as to minimise undue strain and to adjust the deranged thoracic and abdominal functions, but under the influence

of the chronic auto-toxæmia, or perhaps from the emotional depression of sorrow, grief or worry, sooner or later the higher co-ordinating centres struck work and the mechanical and portal derangements ran further riot.

In this way the biological syndrome of cancer in the working of the human machine was believed to arise. The power wasted in undue stress, strain and friction appeared to be converted into the energy of those unknown complicated chemical and physical constructive processes concerned in cell growth and multiplication—a marked contrast to those destructive results of similar forces on the material substance of a non-living machine in causing wear and tear.

Dr. Scanes Spicer said that some might think he was premature in bringing this subject forward now, but at all events he had not been precipitate. As evidence thereof, in debate and in the medical press in 1889, he was upholding the rôle played by the movements of breathing, swallowing, speaking, and generally of injuries from irritation and pressure, during functional movement in the production of disease in the larynx (*British Medical Journal*, September 14, 1889, p. 592), while at intervals ever since he had persistently urged the need for physical training, for erect posture, breathing, thorough expansion of the chest, and special education for the re-acquirement of lost co-ordinations (*Clinical Journal*, October, 1893, p. 369, Presidential Address, Section of Laryngology, British Medical Association, Ipswich, 1900, etc.).

His first slide was a scheme or plan to indicate diagrammatically the centrifugal expansile action of the diaphragm in thoracic inspiration and the centripetal descending action of the same in abdominal inspiration.

Abdominal breathing produced with every breath—

(1) Excessive pulling down of the thorax and the thoracic viscera, generally including the trachea, gullet, cricoid, and sternum, and therefore increased stress, strain, and friction of displaced, stretched, and compressed parts, causing persistent, rhythmic, mechanical irritation at points of attachment of soft parts, or where these latter were compressed by rigid resistance of the endoskeleton.

(2 *a*) Displacement, compression, and derangement of the abdominal viscera.

(*b*) Lessened thoracic suction on the in-breath as compared with thoracic breathing.

(*c*) Loss of the normal influence of the exploratory contraction

of the abdominal wall in emptying the portal area and promoting the general circulation.

Thus were produced simultaneously, irritation about the larynx, throat and gullet (and elsewhere as indicated) and likewise concurrently a blood cachexia.

In general terms he suggested that cancer was the manifestation of a specific biological conjunction, pathological syndrome, or symptom-complex of deranged processes in the working of the body, which processes were :

(1) Neoplasia from chronic irritation of either extrinsic or intrinsic origin ; and—

(2) A faulty constitutional state or blood cachexia, produced as above.

The influence of stress, strain, and friction in the aetiology of disease was too well known and accepted to demand illustration. He was, therefore, introducing no new factor into aetiology or pathology. The novelty of his suggestion was the conception of how the influence of such chronic stress, strain, and friction could arise intrinsically and could act as such a chronic intrinsic irritation as to cause neoplasia ; while in conjunction with this, the same deranged bodily working which caused the abnormal stress, strain and friction, brought about simultaneously a chronic constitutional cachexia by deranging the efficiency of the portal system. His interpretation was not in antagonism to any of the ascertained facts of cancer. It was supplementary to them.

His next slides showed normal and faulty erect postures, and how the transmission of the weight of the head and viscera to the ground differed, causing different degrees of stretch and compression about the larynx. In this connection he called attention to the radiograms of the living subject in which the different position of the head and curve of cervical spine varied the positions, compressions, and stretching of the larynx.

The series of coloured lantern-slides of photographs of frozen sections after Branne's "Topographical Anatomy" showed clearly and quickly the relations of the rigid resistance, *i. e.* the bones and cartilages to the soft tissues about the larynx, and how their conditions would be altered by the different postures and mode of breathing previously shown.

If the cartilages were calcified, ankylosed, roughened or thickened, such conditions must increase unduly the surrounding working stresses, strains and frictions. These, if chronic and not too great, favoured irritative neoplasia in addition to the irritation factor

provided by chronic and habitual exclusive inspiratory diaphragmatic descent.

It was curious how cancer in the larynx appeared to dog the steps of a cartilage. The two best series of operated intrinsic laryngeal cancers were those of Sir Felix Semon and Mr. H. T. Butlin. These demonstrated the close association between cancer and cartilage in the fact that the cartilage was usually involved in the diseased mass, and such cartilage had to be removed (if removable) or scraped at the radical operation. Thus in Butlin's thirteen cases, ten were stated to have cartilage involved; removal of cartilage was indicated in seven and scraping in two; in one case cartilage was bare (no note as to scraping). Growth recurred *in situ*. In Semon's ten cases cartilages had to be removed in six.

It was generally assumed that cancer spread, attacked, and caused disease of the cartilage secondarily. He suggested that it was excessive stress, strain, or friction in connection with the movement resistance, and sometimes ossification of the cartilage that initiated the neoplasia. This latter subsequently took its revenge by cutting off the blood-supply of its irritating tormentor.

His theory afforded a rational interpretation of the natural history of cancer of the larynx. It was in agreement with the age, sex, and site-incidences, the left side predominance, the obscure commencement, the diffuse deep origin, the persistent hoarseness, the early vocal cord paralysis, the relative greater extent in the depths than on the surface, and finally the success of the laryngofissure and removal of diseased parts. What other theory explained these facts?

Numerous anatomical diagrams were laid upon the table after Quain, Luschka, Killian, Elsberg, etc., especially drawn and coloured to bring out the form and relations of the laryngeal cartilages, particularly the cricoid and sesamoid cartilages, and the anterior and posterior vocal nodules.

There was also a collection of published coloured illustrations of cancer of the larynx by leading British laryngologists. Though it was rare to publish diagrams of such at a sufficiently early stage to define the exact site of initiation, there were a few such. Sir Morell Mackenzie's sketches of the earlier stages of the laryngeal cancer of the Emperor Frederick were on view, and taken together with Gerhardt's description, pointed to either a sesamoid cartilage or the posterior vocal nodules being probably the site of initiation. Sir Felix Semon's diagram of Mr. Montague Williams's case apparently opposed his theory, but on the growth being removed

it was found to be attached at the back of the laryngeal ventricle about which the arytaenoid plays in functioning.

At a later stage the relation of the bulk of a laryngeal cancer clustered over a subjacent cartilage was usually apparent, and he showed many instances.

Dr. CATHCART remarked that Dr. Scanes Spicer's conclusion summed up was as follows: That cancer of the larynx was due to the descent of the larynx, which, Dr. Spicer averred, took place as a result of "belly-breathing." The speaker denied that belly-breathing produced descent of the larynx. The old Italian singing-masters used to advocate thoracic breathing because, among other reasons, this kind of breathing pulled down the larynx and rendered the chest-resonance more effective. Thus their opinion was diametrically opposed to Dr. Spicer's, and, if it was correct, Dr. Spicer's conclusions must fall to the ground.

Mr. GAY FRENCH observed that the diagrams and specimens shown were based upon findings in the dead body which materially differed from what took place in the living subject.

The PRESIDENT found himself personally unable to assent to the premises and conclusions expressed in Dr. Spicer's communication. He asked if any member of the Section was able to say anything in their support.

Dr. S. SPICER, in reply to Dr. Cathcart, said that he had laid his anatomical and physiological data before the anatomists and physiologists, and that it lay with them to say whether he was right or wrong. He himself adhered to his expressed views regarding the descent of the larynx during "belly-breathing." Mr. Gay French had called attention to a point which he had always insisted upon.

AN INSTRUMENT FOR THE MORE SPEEDY REMOVAL OF THE NASAL SPINE IN SUBMUCOUS RESECTION OF THE SEPTUM.

BY MR. HERBERT TILLEY.

The instrument was a bayonet-shaped hand-gonge, the cutting edge of which was V-shaped, the extremities of the V being blunted in order to avoid tearing the mucous membrane. It possessed the advantage of not slipping off the nasal spine, as Killian's chisel was apt to do.

The PRESIDENT thought that the instrument supplied a felt want.

A CASE OF LEPROSY IN A MAN, AGED TWENTY-ONE; ULCERATION OF NASAL MUCOSÆ; THE BACILLUS HAD BEEN ISOLATED FROM THE DISCHARGE.

BY DR. H. J. DAVIS.

The patient, a lawyer's clerk, contracted leprosy at the Cape five years ago. He was under the care of Dr. Abraham at the

West London Hospital, where he was being treated with subcutaneous injections of Nastin B.

The nasal cavities were affected three years after the first symptoms, which commenced in the little finger; larynx also affected; secondary laryngitis. The thickening of the nose and lobules of the ear, the nodules and pigmentation on the face and elsewhere were noteworthy, as was the typical appearance of the hands, which were soft and felt like satin. The fingers were slowly withering; the toes were also affected. The ulceration in the nose resembled lupus, but the yellow discharge had subsided since treatment.

Patient stated "that five years ago, when returning from Cape Town races one cold evening he felt his little finger becoming numb and tingling. To see whether it was quite insensitve he put it into a cup of boiling water, but he felt nothing at all; the finger blistered and slowly withered, and so on to the next finger and to those of the opposite hand."

There were patches of anæsthesia and insensitiveness to heat and cold in all four limbs, and in consequence the disease was primarily diagnosed as syringo-mylia, but its true nature slowly declared itself, and he came to London for treatment.

Dr. JOHNSON HORNE had not examined the larynx, and would have liked to hear more of it, as he was interested in the relationship of the nasal condition to that of the larynx.

Dr. SECCARA (Buenos Ayres) had had considerable experience of leprosy in Peru and Paraguay, and had published a monograph on the disease in those countries. He had repeatedly been able to find the bacillus, not only in the nasal mucosa, but also in the nasal discharges. The nose was not infrequently the starting-point of the disease.

Dr. STCLAIR THOMSON had shown a case of leprosy in a coloured man before the Section two years ago. He wondered what the law was in South America as regards the segregation of cases of leprosy. The patient to whom he had alluded went openly about his avocations in England, a freedom which was open to criticism. He did not think that leprosy was a notifiable disease in this country.

Dr. DUN MCKENZIE had been struck with the same thought as Dr. StClair Thomson some years ago in connection with a case of leprosy he had seen in England. The patient was an Englishman who had contracted the disease abroad. In that case he had been interested in the larynx, which had undergone general infiltration and presented large tubercular nodules. The voice was hoarse and rough. The patient died of the disease, and was employed in business in London until shortly before his death.

Dr. DONELAN remarked that the old English statutes for the segregation of lepers were still un repealed.

Dr. FITZGERALD POWELL was interested to hear of the treatment by nastin, because all former methods of treatment had proved useless.

Dr. DAVIS, in reply, said that the patient had recently burned his hand severely in consequence of the anæsthesia.

THYRO-LINGUAL CYST REMOVED FROM A GIRL, AGED SEVEN, WHO WAS ALSO EXHIBITED; OPERATION FOLLOWED BY SYMPTOMS OF ACUTE THYROIDISM.

By DR. H. J. DAVIS.

The child had enlarged tonsils and adenoids. She was admitted for operation as there was a small swelling under the jaw in the mid-line, which the parents wished removed as it was a disfigurement. This was done first. The cyst, as large as a grape, was attached to the tongue and hyoid bone; it was easily removed entire, the wound sutured with horsehair, and closed with collodion. In the evening the child became restless; the temperature rose to 104° F., the pulse was intermittent and irregular (160 per minute); the pupils were dilated, and the face was crimson—signs of acute thyroidism. The neck became swollen and puffy, and this persisted for six weeks. The wound healed by first intention. The child complained of no inconvenience beyond “her heart thumping.”

Mr. W. G. Spencer attributed the disturbance to leakage of thyroid secretion and its absorption in a wound that was undrained. The exhibitor had no doubt that this explanation was the correct one.

The PRESIDENT also agreed with Mr. Spencer's suggestion.

A CASE OF UNILATERAL OPTIC NEURITIS AND COMPLETE OPHTHALMO-
PLEGIA EXTERNA RESULTING FROM ACUTE SPHENOIDAL SINUSITIS;
OPERATION; PATIENT WELL.

By DR. H. J. DAVIS.

A girl, aged twenty-five, was admitted under Dr. Beddard as a supposed case of cerebral tumour; he transferred her to Dr. Davis with a diagnosis of sinus involvement. She attributed her headaches “to standing for hours in the sun at the late King's funeral.” Onset sudden; acute pain in right upper jaw and forehead, with general constitutional disturbances, sickness and giddiness.

Mr. Percy Dunn reported ptosis, diplopia, dilated pupil and right-sided optic neuritis only, and complete ophthalmoplegia externa. Transillumination showed right infra-orbital shadow.

Operation forthwith. Antrum opened through cheek; outer wall of nose removed; middle turbinal and ethmoid mass removed; sphenoidal sinus full of pus, opened and drained. Ocular symptoms slowly subsided, and patient left hospital well six weeks later.

A one-sided optic neuritis points to naso-orbital disease, whereas disease of central origin is characterised usually by double optic neuritis.

Photographs were exhibited showing patient's condition before, and three weeks after operation.

The PRESIDENT congratulated Dr. Davis on the excellent result he had obtained.

Dr. BRONNER asked whether the field of vision in the left eye was taken.

Dr. HILL said that the assumption made was that the ocular symptoms were due to the sphenoidal disease, but asked whether they might not rather have been caused by ethmoidal involvement. He reminded the Section of a case he had mentioned last session, in which he had found empyema of one antrum associated with optic neuritis of the opposite side. After operation on the antrum the optic neuritis had disappeared.

Dr. DAVIS, in reply to Dr. Bronner, said that the other eye was found to be quite normal. The antrum was also affected, but secondarily to the sphenoidal disease he thought. Cerebral tumour had been suspected, but the limitation of the optic neuritis to the one eye had led to the correct diagnosis.

EMPYEMA OF ANTRUM; MUCCOUS POLYPI BOTH NOSTRILS; OPERATION;
DISEASE NOW MALIGNANT; SARCOMA; MAN, AGED SEVENTY-ONE.

BY DR. H. J. DAVIS.

At the May meeting of the Section, 1909,¹ a case of chronic antral disease in a woman, aged sixty-eight, was shown in which the disease had become malignant. The jaw was removed for sarcoma. Some doubt was expressed by members as to whether malignant disease had developed in this way, and further evidence was asked for. The case now exhibited was a parallel in every way. For three years the patient had had muccous polypi on both sides frequently snared and twice curetted. Left antrum became involved; it was opened and drained (Caldwell-Luc method). This had to be repeated, and on the second occasion the tissue removed looked malignant, but the pathological report was against it. The swelling subsided, but again recurred.

A piece removed from the antrum a week ago was reported as "sarcoma." The growth was friable and very vascular, and there was no doubt now about the diagnosis. The superior maxilla had been removed a few days ago, and was on exhibition.

Dr. STCLAIR THOMSON asked if Dr. Davis had been able to determine the site of origin of the growth.

¹ JOURN. OF LARYNGOL., RHINOL., AND OTOL., vol. xxiv, No. 6, p. 326.

Dr. DAVIS replied that it seemed to have sprung from the antrum; the ethmoid was unaffected. In the removal of the upper jaw it had been found necessary to sacrifice the infra-orbital plate. The patient was doing well, and he hoped that a cure would result.

BOY, AGED SEVEN, WITH EMPYEMA OF MAXILLARY ANTRUM (THIS CONDITION IS RARE IN CHILDREN).

By Dr. H. J. DAVIS.

The child was taken to a casualty department two months ago, and under the supposition that the swelling was due to carious teeth these were extracted and a hole made in the jaw. The case well illustrated the futility of attempting to drain the antrum by the old method, especially in children, for the permanent teeth shield the antrum, and it is probably never opened at all. The wound became septic, and little improvement resulted until the antrum was drained into the meatus three weeks ago. The jaw was still swollen, and several teeth had been shed.

Dr. BETHAM ROBINSON had operated on a boy aged six. Operation was difficult at this age, both on account of the difficulty of getting above the roots of the teeth and of the small size of the antrum in childhood. He thought that the palatal swelling was evidence of bone mischief, and suggested that the antral suppuration might have been secondary.

Dr. BRONNER referred to the fact that scarlet fever was a common cause of sinus suppuration in children.

Dr. LOGAN TURNER observed that there was some dead bone on the alveolar side of the palate, and suggested that the cause of this and of the palatal swelling might be osteomyelitis, as described by several authors.

A MEMBER asked whether any member had seen a case of antrum suppuration in a child which had healed without any external deformity.

Dr. TILLEY said that he had had such a case.

Dr. DAN MCKENZIE wondered whether the osteomyelitis had been caused by the operative measures adopted, as in a case he had seen.

Dr. DUNDAS GRANT said he had related before the Odontological Section of the British Medical Association at Sheffield the case of a child, aged five years, with empyema of the maxillary antrum in whom there was no external swelling. He opened it through the nose. It was the only case of the kind he had seen in so young a child, so he concluded it was rare. Dr. Bronner had drawn attention to the influence of scarlet fever in producing those malignant forms of inflammation in the sinuses, and Killian had read a paper on the subject before the German Laryngological Society.

The PRESIDENT remarked that Mr. D'Arcy Power had reported a case of antrum suppuration in a child, aged eight weeks, which he had ascribed to injury inflicted at birth by the midwifery forceps. He thought that this case was probably one of osteomyelitis rather than one of pure empyema.

Dr. H. J. DAVIS, in reply, said that he had not seen the case at the

onset of the disease. The first symptoms were pain and swelling of the face, for which the teeth were removed. Then the attempt to bore a hole into the antrum through the alveolus was made. The osteo-myelitis present he attributed to the wounds made in the mouth. The question of malignancy had been raised, but the fact that the child was recovering disposed of this supposition.

SPECIMEN OF A LARGE NASO-PHARYNGEAL POLYPUS REMOVED FROM A BOY, AGED ELEVEN.

BY DR. H. J. DAVIS.

It was attached to the base of the sphenoid, and produced considerable deformity; some paresis of the palate remained; boy otherwise well.

Mr. TILLEY asked whether access had been made through the palate or the nose—an important point in view of the necessity for the complete removal of the tumour.

The PRESIDENT had recently had a similar case under his care. He had selected the Rouge-Denker method of operating, but, although the exposure so obtained was good, he had found it necessary to split the palate also. The patient, after the tumour was removed, was so exhausted that he had not had time to suture the palatal wound, and as some sepsis followed the operation he had not so far been able to do so, although the patient was now recovering.

Dr. H. J. DAVIS, in reply, said he had removed the tumour by splitting the palate. The bleeding was terrific, but it was stopped by plugging.

TONSILLITH REMOVED FROM PATIENT SHOWN AT THE LAST MEETING OF THE SECTION.

BY MR. CHARLES A. PARKER.

An incision, $1\frac{1}{4}$ in. in length, was made through the anterior surface of the soft palate and the calculus was then exposed to view. By means of pressure from behind and traction with forceps in front it was removed, but not without some little difficulty and slight laceration of the soft parts. The wound was stitched up with horse-hair suture and healed satisfactorily. The calculus was irregularly spherical in shape, measuring in its greatest circumference $4\frac{5}{8}$ in., and in the smallest $4\frac{3}{16}$ in. It weighed 490 gr.

SPECIMEN OF RECTERENT PEDUNCULATED FIBROMA OF POSTERIOR PILLAR OF FAUCES $1\frac{1}{2}$ IN. LONG.

BY DR. ADOLPH BROXNER.

The growth, which had been removed from a woman, aged

fifty-five, was an example of a rare condition. It had occurred three times—once in 1900, in 1903, and again recently.

LUPUS OF THE LARYNX IN A WOMAN, AGED THIRTY-SIX.

BY DR. KELSON.

Patient, who was married and had had one child and no miscarriages, came to hospital three years ago complaining of soreness and rawness of her throat. On examination, a red granular condition of the posterior wall of the pharynx was found, with slight ulceration; the epiglottis was also swollen and presented the same red granular aspect; there was very little discharge. Auscultation gave no evidence of lung disease, and no tubercle bacilli were found in such expectoration as could be obtained. The treatment, galvano-cautery (direct and indirect methods) and arsenic internally, had been partially successful, but the disease had shown markedly relapsing and slowly spreading characteristics. At present the pharynx had healed, but a cicatricial band could be seen; the epiglottis was defective; the ventricular bands were swollen, and there was some arytenoid swelling. The view of the vocal cords was obstructed, but they were seen to be red and swollen when a glimpse was obtained. Since the inside of the larynx had become affected the patient had become hoarse.

Dr. LOGAN TURNER asked whether Dr. Kelson had tried tuberculin. He himself had been using it, but only with moderate success. One or two cases had been cured.

Dr. DUNDAS GRANT said the difficulty in judging as to the effect of tuberculin was that such cases fluctuated, and under favourable hygienic conditions there was often much improvement in them. He had seen several cases under tuberculin treatment at Brompton Hospital, and the tuberculin seemed to be beneficial.

The PRESIDENT advised the use of tuberculin, using "T.E." and beginning with $\frac{1}{50000}$ mgrm. of the solid substance.

Dr. KELSON said he had shown the case before using tuberculin in order that the effect of the remedy might be observed.

STRICTURE OF THE LOWER END OF THE ESOPHAGUS—SPASMODIC?

BY MR. J. GAY FRENCH.

The patient, a woman, aged thirty-two, stated that she had been perfectly healthy till she was twenty years old; she then noticed the first symptoms of her present complaint, which consisted in a difficulty in swallowing solids. At first, however, she could do so by taking a glass of water immediately after the solids. At

this time her weight was 8 st. 7 lb. Slowly but gradually she got worse, till at the age of twenty-seven she could take no solids at all, and even fluids caused vomiting. Her weight dropped to just over 5 st. She was admitted into a London hospital and treated for gastric ulcer. She was kept in for three months and discharged. She stated that the vomiting was better, but that she still had the same difficulty in getting any food down.

The patient first came under the exhibitor's care about a year ago. Her weight then was 8 st. She could not take any solids, but stated that she could get fluids through, after swallowing, by lying on her right side and taking deep breaths. When given a couple of glasses of water she could regurgitate this without any great effort.

Direct œsophagoscopy revealed a very dilated œsophagus, the lower portion of which was filled with fluid and frothy mucus. Some of this fluid was removed and examined; no trace of free hydrochloric acid was found. The exhibitor had so far been unable to get a bougie through the cardiac orifice.

The patient had been examined with X rays, and on the last occasion was watched for over an hour with a screen—after the administration of 2 oz. of bismuth carbonate by the mouth—and a series of photographs taken and direct drawings made. These were shown with the patient.

Dr. WM. HILL, with reference to the question of spasm, expressed a doubt as to the existence of spasm severe enough and prolonged enough to cause organic changes in the gullet, such as the dilatation in this case. At any rate, œsophageal spasm could not be seen under ordinary conditions of direct examination, because the cocaine or chloroform dispelled it. He himself had never seen a case, and the same was true of everyone else who had ever made a similar attempt. C. Jackson's remarks were based upon theoretical considerations. It was possible that transitory spasm could lead on to inflammatory changes and so to a spastic paralytic stricture, but he questioned the existence of such an event. And it was foolish to apply the term "spasm" to a stricture when it had been in existence for a long time. With regard to treatment, he recommended the insertion of Symonds' funnels for a time at intervals, a method which would lead to many weeks of comparative comfort. Symonds' funnels were to be preferred to dilatation by means of bougies, for the latter readily led to paralysis of the œsophageal muscle.

Dr. DUNDAS GRANT remarked that Dr. Hill's experience differed from that of Dr. Guisez, of Paris. He had been hoping to find such cases as the latter had described, but had not yet seen one. Dr. Guisez's description of cardio-spasm was very definitely established, and his recent book on diseases of the œsophagus embodied many of the monographs which had appeared in the JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY. Dr. Guisez used a dilator, which he introduced into the cardiac orifice of the stomach, apparently with the result of causing

complete disappearance of the dilatation of the œsophagus. He was surprised to read the description, but he believed it was accurately drawn from Nature.

Sir FELIX SEMON said "*Virere fortes ante Agamemnona.*" It was, he thought, scarcely wise to speak of a disease as non-existent unless someone had seen it. He had himself successfully treated spasm of the œsophagus before the days of œsophagoscopy, and he saw no reason why the gullet should not be as liable to spasm as other tubular viscera. He narrated a case in support of his beliefs. It was that of a young man, who, after a partial œsophageal obstruction, suffered from complete obstruction lasting for two days. He passed a bougie, and found that it was arrested about two or three inches below the cricoid plate. A larger bougie was also arrested. He then inserted the biggest bougie he could get, and after some pressure it suddenly passed through the stricture to the stomach. He then withdrew it and re-introduced it, this time without difficulty. The patient was able to drink at once, and a week later was found to be quite well. As far as the speaker knew he had never had a return of the trouble.

Dr. JOBSON HORNE said that there were also great men after Agamemnon, because it was the after-history of these cases that was important. What happened to them ten years after the spasmodic stricture was cured? He himself was not inclined to dogmatism on the point.

Dr. FITZGERALD POWELL held that there was a good deal to be said on both sides of the question. Nowadays spasmodic strictures were generally considered to be secondary to some inflammatory state. Such spasms were fleeting in their nature. In the case under discussion the size and persistence of the stricture told against the diagnosis of spasm. It was, he thought, more likely to be a fibrous stricture, and for this reason was suitable, not for treatment from the œsophagus, but rather from the side of the stomach.

Mr. TILLEY related a case illustrating œsophageal spasm. A lady, aged sixty-two, had been suffering from supposed malignant disease of the œsophagus for many months. She was unable to swallow solid food, and the bougie could not be passed. The speaker saw the patient twice; on the first occasion the symptoms were not suggestive of malignant disease, and the difficulty in swallowing was abolished for some months by passing a bougie. Eighteen months later he again saw her on account of a recurrence of dysphagia, which on this occasion had been in existence for a considerable time. All efforts to pass bougies had failed. He examined the œsophagus by the direct method, and was able to assure himself and to convince the patient that she was not suffering from cancer. After the examination he persuaded her to eat something, and now, two years later, she was in good health.

Mr. SECCOMBE HETT related a case, the reverse of Mr. Tilley's, in which difficulty in swallowing had been relieved six years ago by the passage of bougies, and a consequent diagnosis of spasm had been made. He had seen the case recently and found the patient dying of cancer of the œsophagus, with large secondary growths in the neck.

Dr. HILL said that he might have stated the case against spasm a little strongly in his former remarks. At the same time he had never seen an objective organic lesion resulting from spasm, and in Mr. French's present case he held that the dilatation of the œsophagus could not be due simply to spasm.

The PRESIDENT had seen the case mentioned by Mr. Tilley, and had

tried, without success, to pass a bougie through the stricture. From the history he had formed the opinion that it might be spasmodic, but from the patient's age he had regarded the symptoms as very suggestive of malignant disease.

MR. GAY FRENCH, in reply, with reference to the occurrence of spasm in the oesophagus, argued that as spasm was admitted to occur in other parts of the alimentary canal, there was no *à priori* reason why it should not occur in the oesophagus. Congenital pyloric stenosis, for example, which was an organic lesion, was generally supposed to take origin in simple spasm of the pylorus. The suggestion that the stricture in the case under discussion was due to some inflammatory condition was negatived by the fact that the girl had never had any pain. With regard to treatment, he would try the effect of a Symonds' tube. Since sending in his notes on the case he had succeeded in passing a bougie through the stricture, but when the patient tried to drink after the bougie had been passed the water returned. If treatment from the oesophageal side failed to relieve the condition, it would be necessary to perform gastrotomy so as to dilate the stricture from below.

A CASE OF MYASTHENIA GRAVIS WITH LARYNGEAL SYMPTOMS.

BY MR. SOMERVILLE HASTINGS.

A boy, aged fourteen, was first brought to the Middlesex Hospital in July, 1910, complaining of difficulty of breathing and swallowing. His mother, who brought him, said that for the last two months he had regurgitated fluids through his nose when drinking, and that she had found an increasing difficulty in understanding what he had to say, especially towards night. He had not suffered from sore throat. When examined about this time the vocal cords were seen in the cadaveric position, and were almost stationary. The boy was unable to cough, and articulation was defective. The soft palate moved very slightly, and there was some congestion of the mucous membrane of the nose, but nothing in the naso-pharynx. The knee-jerks were normal.

On October 4, 1910, he was sent into the hospital and seen by Dr. Voelcker, who diagnosed myasthenia gravis. It was then noted that the palate became completely immovable after the patient had said "Ah" some half-a-dozen times. Lateral nystagmus also appeared after repeated movements of the eyes. The boy was unable to screw up his eyes or wrinkle his forehead, and the facial muscles generally were very weak and showed the "myasthenic reaction" to electrical stimulation. The muscles of mastication and those of the trunk and limbs were quite normal. The thymus was not enlarged.

The patient improved a great deal while in the hospital, and when last seen (November 25) was much better. The laryngeal

condition had especially improved, and the cords came together fairly well. He was still unable to whistle, and could not completely close his eyes. The soft palate hardly moved at all.

Dr. HILL had seen a similar case lately at the Clinical Section. The appearance of the disease in the throat first of all was an important point.

Mr. SOMERVILLE HASTINGS had brought the case because he had missed the diagnosis himself. It looked like diphtheritic paralysis.

CASES ILLUSTRATING RESULTS OF REMOVING NODULES FROM THE CORDS BY MEANS OF GALVANO-CAUTERY (BY THE INDIRECT METHOD).

BY DR. E. A. PETERS.

A. L——, music-hall artiste, aged twenty-five (private patient). Loss of upper notes and occasional total loss of voice due to laryngitis and unilateral nodule on cord. Removal of nasal obstruction and rest gave some improvement, but the galvano-cautery removed the nodule completely, and she could now sing with a good voice.

Mrs. W——, aged thirty-one (private patient), complained of loss of voice for one year, particularly affecting the upper notes of her contralto voice. The nodule was removed by galvano-cautery. The voice was better than ever it had been.

H. S——, aged forty-one, foreman fitter, shown last session with nodule on left cord and impaired voice. The removal by galvano-cautery and treatment for nasal obstruction had restored his voice.

Mr. C. HORSFORD congratulated Dr. Peters on his success. The removal of singers' nodules was difficult in any way, and he would have supposed removal by the galvano-cautery to be the most dangerous. He asked whether the nodules had been lightly or deeply cauterised.

Dr. STCLAIR THOMSON referred to the previous discussion on the use of the galvano-cautery in the treatment of singer's nodes. On that occasion the cautery had been banned, so that he had feared to use it for this purpose since.

Dr. JOBSON HORNE said that in the treatment of singers' nodules, as in the treatment of laryngeal tuberculosis, the galvano-cautery was all right if it was not carried to excess. If the node was lightly touched and the voice rested the outgrowths would shrivel up without any evil consequence.

Dr. L. H. PEGLER asked what remedy could be used for singers' nodules if the cautery was to be prohibited. Silver nitrate fused on the end of a long probe had been suggested, but it would have to be used several times. Before applying the cautery it was imperative to train the patient, so as to get complete control of the larynx.

Dr. FITZGERALD POWELL, notwithstanding the good cases now being discussed, expressed a warning against the use of the cautery. Even in these cases the result was not perfect. In one patient the cord which had been operated on was thinner and more tightly stretched than its neighbour.

He advised that the nodules should be left alone save for painting with perchloride of iron, and if the voice was rested the disease would get well of its own accord, and without exposing the patient to any risks.

MR. CHICHELE NOURSE agreed with Dr. F. Powell. Obstructions in the nose and throat should be operated on, the voice-production modified, and the nodules would disappear spontaneously.

The PRESIDENT asked Dr. Peters what interval had elapsed since the cauterisation. It was better, he thought, to do too little than too much.

Dr. PETERS, in reply, said that one had been done a year and another six months ago. The results were undoubtedly satisfactory. In applying the cautery the larynx was anaesthetised until the patient would allow of detailed manipulation as tested by inserting a probe. One single application of the cautery was employed. He used a flat cautery, bent on the flat so that the point could be seen, and did not turn on the current until the terminal was actually in contact with the nodule. In this way much better results were got than by using forceps. Generally speaking, he would not cauterise small nodules; general treatment was sufficient for them. With regard to operating on the nose and waiting for the nodules to disappear, this had at one time been his practice. But some years ago two patients with singers' nodules and nasal obstruction came to him, and when he suggested clearing the nose before restoring the voice they left him and went to someone else. Consequently he now preferred to give the voice back first of all, and after that to operate on the nose.

CASE FOR SUGGESTIONS AS TO TREATMENT.

BY MR. T. JEFFERSON FAULDER.

H. H—, labourer, aged thirty-three. Hoarseness of voice began in 1906; ever since then had suffered from attacks of hoarseness with slight intermissions. Since November, 1909, the patient had frequently been unable to speak except in a feeble whisper. Previous illness in 1906, syphilis; treated for eighteen months. Had been treated also for a considerable time lately with mercurial inunctions and iodides with only temporary occasional improvement. Patient's general condition was very good and the lungs seemed healthy. There was general chronic laryngitis with very considerable interarytenoid thickening.

Dr. L. H. PEGLER had had this case under his care for nine months' and had not been able to do him any good.

Dr. JOHNSON HORNE thought the case one of pachydermia due to syphilis. Locally he would remove the interarytenoid thickening freely, because of the likelihood of recurrence. He would leave the vocal cords themselves alone, but would reduce the ventricular bands by making linear incisions into them from before backwards.

The PRESIDENT advised that care should be taken to eliminate tuberculosis. Von Pirquet's test would be useful.

Mr. PATERSON, replying for Mr. Jefferson Faulder, said that the

forceps had shown the laryngeal tissue to be very tough. A specimen had not been obtained. It was thought to be a case of syphilis.

LARYNGEAL TUBERCULOSIS ; CURE ?

BY MR. CYRIL HORSFORD.

Woman, aged thirty-seven, after suffering from hoarseness had some difficulty in swallowing for two years; was first seen by exhibitor in July, when the epiglottis was greatly swollen, somewhat nodular, and ulcerated. The right vocal cord swollen and a small ulcer on its surface. The right ventricular band and the anterior surfaces of both arytenoids were also ulcerated. At that time she had a slight evening temperature (99° F.), and there was evidence of tuberculous deposits in both apices. The case was treated by immediate amputation of the diseased portion of the epiglottis, and under cocaine pure carbolic acid was carefully applied (four times at intervals of a fortnight) to the ulcerated areas.

There was now no sign of infiltration or ulceration in the larynx.

A section (cut by Dr. Wyatt Wingrave) of the diseased epiglottis was shown under the microscope.

The PRESIDENT congratulated Dr. Horsford on the result. The larynx seemed to be free from deposit.

Dr. HORSFORD remarked that he had found that the ulcers healed rapidly under the influence of the phenol, and wondered whether other members had found it of service.

CARCINOMA OF ŒSOPHAGUS ; ? TEMPORARY CURE UNDER RADIUM TREATMENT.

BY DR. WILLIAM HILL.

Male, aged forty-five, first sought advice at hospital in December of last year for dysphagia; had been unable to swallow meat for six months, and soft food with difficulty. On œsophagoscopic examination, hard, nodular tumour of anterior and left lateral wall of lower cervical œsophagus seen with œdema above and also below, extending down to about the bronchial constriction, bleeding easily when touched. Cancer diagnosed without hesitation from appearance of strictured area. Under six prolonged applications of radium salt objective evidence of malignancy disappeared; the lumen in lower cervical and upper thoracic region, which was very small and crescentic, was now normal. Progressive improvement

in swallowing, which, however, was not quite normal. Increase in weight and vigour.

CARCINOMA OF DEEP PHARYNX WITH EXTENSION TO GULLET AND TO POSTERIOR MARGIN.

By DR. WILLIAM HILL.

Female, aged forty-three. The largest development of the growth was on the pharyngeal aspect of the pharyngo-laryngeal party wall. A surgeon had recently advised Glück's operation on this case as justifiable. The exhibitor had found, however, that there was a second extensive focus of sprouting growth half-way down the thoracic oesophagus. ? Extension *per contiguum* (Semon). Radium to be tried as a palliative.

PROCEEDINGS OF THE SCOTTISH OTOLOGICAL AND LARYNGOLOGICAL SOCIETY.

First Meeting, November 11, 1910, at the Royal Infirmary, Edinburgh.

DR. LOGAN TURNER *in the Chair*.

Report by DR. W. S. SYME.

A PATIENT TWO AND A HALF YEARS AFTER OPERATION ON THE RIGHT LABYRINTH.

By DR. W. G. PORTER.

Granulations were removed from the region of the horizontal canal but the remaining canals and the cochlea were not interfered with. The vertigo had disappeared and the patient could follow his employment, but complained of severe tinnitus. It was a question for discussion whether any further surgical treatment should be carried out.

DRS. KERR LOVE and THOMAS BARR advised against this, and Dr. FARQUHARSON suggested the use of the high-frequency current and injections of fibrolysin.

NYSTAGMUS OF THE RIGHT VOCAL CORD AND SOFT PALATE.

By DR. W. G. PORTER.

The movement of the cord consisted of a rapid adduction and a slower abduction and the rate was about 150 a minute. It was

thought that the phenomenon was due to bilateral cerebral disease probably associated with arterio-sclerosis. The patient died suddenly but no *post-mortem* examination was obtained.

DOUBLE FRONTAL SINUS DISEASE WITH CEREBRAL INVOLVEMENT.

BY DR. J. D. LITHGOW.

There was a deficiency of the cerebral wall of the right sinus and through this a fungating mass of necrotic cerebral tissue presented. Operation resulted in recovery.

FRONTAL SINUS DISEASE WITH EXTRA-DURAL ABSCESS.

BY DR. J. S. FRASER.

The case resembled the last but ended fatally. Patient, a female, aged twenty-one, suffered from cold in the head six weeks before admission. Four weeks later she developed frontal headache and sudden swelling above the left eye. To these symptoms were added, five days before admission, vomiting, shivering, and general pains. The nasal discharge ceased suddenly three days before admission. When admitted her temperature was 102° F., pulse 104. She was drowsy and lay on her right side with knees flexed. Percussion of the skull caused pain, especially over the left frontal region. Examination of the fundi oculorum showed engorgement of veins. There was no strabismus or nystagmus. The sense of smell appeared normal. There were no paralytic phenomena and the reflexes were normal. Spinal puncture yielded a clear fluid with no increase of pressure and containing neither cells nor organisms. Leucocytosis 12,700, polymorphs 90 per cent. On the day following admission there was a rigor and the temperature rose to 105° F. In Dr. Turner's absence Dr. Fraser saw the patient and diagnosed acute frontal sinus suppuration with possibly an intra-cranial complication. On operation on the left sinus the cavity was found full of pus. An opening was made through the intersinusal septum into the right sinus, which was found in a similar condition. There was no bone disease. A second lumbar puncture yielded a clear sterile fluid. Two days after operation a marked left internal strabismus developed and the patient remained drowsy but complained of headache when questioned. In consultation with Dr. Edwin Bramwell it was decided to explore the left frontal lobe. Immediately on opening

through the inner wall of the left sinus stinking green pus escaped. A large extra-dural abscess containing at least an ounce of pus was evacuated. On culture staphylococci, streptococci, gram + reniform bacilli, diplococci resembling *Micrococcus catarrhalis*, diphtheroid bacilli, leptothrix Gram —, and bacilli like *Bacilli influenza* were obtained. The dura mater bulged and was incised and the frontal lobe explored, but with negative result. A third lumbar puncture gave a result similar to the previous. Collargol, 5 mgrm., was injected into the spinal canal. The patient, however, became comatose and died on the following day.

Post-mortem Examination.—On the right cerebral hemisphere there was a thick coating of yellow and very offensive pus; on the left there was much less. There was little or no sub-arachnoid collection. There was practically no pus at the base of the brain, except a little on the under surface of the right temporo-sphenoidal lobe. There was no obvious communication with the nose.

Dr. SYME remarked on the increasing frequency with which reports of intra-cranial complications of frontal sinus disease were being published, and pointed out that in reference to the question of operation on the sinus this danger must be taken into account.

Dr. TURNER stated that, besides these two cases, one other (making three within the year) had occurred in the Edinburgh Royal Infirmary, and he drew attention to the statistics of Gerber, who has collected 150 cases of intra-cranial disease following suppuration in one or other of the nasal accessory cavities.

PURULENT LABYRINTHITIS WITH DEATH FROM LEPTO-MENINGITIS.

By DR. FRASER.

The meningitis was probably present on admission. The labyrinth was opened by a double vestibulotomy. A lantern demonstration of the internal ear was given showing the condition after operation. The vestibule was efficiently drained, but pus was present in all the coils of the cochlea, especially in the scala tympani, in the ductus endo-lymphaticus, and in the ductus perilymphaticus. The inflammatory process could also be traced to the internal auditory meatus from the scalæ of the cochlea along the branches of the cochlear nerve.

Drs. T. BARR, KERR LOVE, and ALBERT GRAY discussed the indications for opening the internal ear spaces, and the general opinion expressed was that there is a tendency at present to too hasty interference with the labyrinth in aural suppuration.

KILLIAN'S OPERATION FOR UNILATERAL FRONTAL SINUS DISEASE.

BY DR. FRASER.

The patient was exhibited.

CEREBRO-SPINAL RHINORRHEA.

BY DR. MALCOLM FARQUHARSON.

The condition followed a severe fall on the back of the head. There was a clear watery discharge from the right nostril, presenting the characteristics and conforming to the tests of cerebro-spinal fluid. The patient suffered from severe headaches before the nasal discharge commenced. There was now complete double optic atrophy, and on the right side there was deafness of nerve type. The nasal passages were narrow, but otherwise appeared healthy.

Dr. TURNER suggested the presence of an intra-cranial tumour, and recommended that the patient should be examined by a neurologist.

Dr. SYME advised the performance of spinal puncture.

ANGIO-NEUROTIC PARALYSIS OF THE RIGHT ACOUSTIC NERVE.

BY DR. M. FARQUHARSON.

The patient, a young woman, was suddenly attacked with vertigo, deafness, and severe tinnitus, accompanied by pallor of the face and nausea. Complete recovery resulted in a few minutes. On examination the ear was normal. Under treatment by X rays and electric current to the sympathetic in the neck, with injections of 1 in 1000 adrenalin, the attacks had become less in frequency and severity.

LUPUS OF THE NASAL CAVITY; ROUGE'S OPERATION.

BY DR. M. FARQUHARSON.

The operation had been performed to permit of the treatment of extensive lupus of the nasal cavity.

A LARGE EPITHELIOMATOUS GROWTH OF THE PHARYNX; TREATMENT BY X-RAYS AND RADIIUM.

BY DR. M. FARQUHARSON.

The treatment had resulted in retardation and diminution of the growth with relief of pain, with, however, succeeding rapid extension.

LARGE CHOANAL POLYPUS ON THE LEFT SIDE.

BY DR. M. FARQUHARSON.

By posterior rhinoscopy its attachment to the posterior part of the middle meatus could be seen.

Dr. BROWN KELLY offered some observations on the relation of these polypi to the antral cavity.

PAPILLOMA ATTACHED TO THE ANTERIOR THIRD OF THE LEFT VOCAL CORD.

BY DR. M. FARQUHARSON.

CONGENITAL MALFORMATION OF THE LARYNX.

BY DR. M. FARQUHARSON.

The left arytenoid prominence was much smaller than the right, probably from an absence of the accessory cartilages. The patient came to the hospital for some trouble unconnected with the larynx, and the movements of the cord and the voice were normal.

LARGE SWELLING IN THE FLOOR OF THE LEFT NOSTRIL JUST INSIDE THE ALA.

BY DR. LOGAN TURNER.

The patient was a woman. The swelling was tense and covered by skin, and was freely movable. The diagnosis was that it was a retention cyst of one of the mucous glands in this neighbourhood.

Drs. BROWN KELLY, FULLERTON, and FRASER agreed with this, and the first referred to a number of similar cases he had seen, remarking on the much greater frequency with which, from his experience, they occurred in females than in males.

LARYNGEAL TUBERCULOSIS; INJECTION OF 85 PER CENT. SOLUTION OF ALCOHOL INTO THE RIGHT SUPERIOR LARYNGEAL NERVE FOR THE RELIEF OF DYSPHAGIA.

BY DR. LOGAN TURNER.

The patient had had two injections at an interval of three weeks with relief of the pain, especially since the latter injection. Unfortunately the disease had extended to the left side, so that the relief is only partial.

Dr. PETERKIN made some observations on this method of treatment.

ACUTE LEPTO-MENINGITIS COMPLICATING CHRONIC MIDDLE-EAR SUPPURATION; RECOVERY.

BY DR. LOGAN TURNER.

Two cases were shown. One, a male, aged sixteen, had left middle-ear suppuration for years. A week before admission he was seized with acute symptoms, vomiting, headache, vertigo, and elevation of temperature. Lumbar puncture showed the cerebro-spinal fluid under pressure and slightly turbid, with excess of albumen. The radical mastoid operation was performed. No evidence was found of inner ear disease. Two days later neck rigidity, double Kernig, severe headache, high temperature, no optic neuritis. A second lumbar puncture was done, and from the fluid withdrawn *Streptococcus pyogenes*, *Bacillus proteus*, and a Gram + anaërobe were grown, and the same organisms were found in the discharge from the mastoid. Anti-streptococcic serum was injected into the spinal canal on two occasions and subcutaneously on five, and spinal puncture was frequently performed. At the end of three weeks all the symptoms had disappeared.

The second case, a male, aged twenty-nine, was somewhat similar, except that in him in the left, the diseased ear, there was evidence of vestibular impairment, the caloric reaction being negative, and there was spontaneous nystagmus towards the healthy side. The cochlear nerve remained active. Symptoms of meningitis showed themselves, but there was no optic neuritis. Lumbar puncture yielded fluid under pressure and turbid, containing polymorphs, lymphocytes, and degenerated epithelial cells. The radical mastoid operation was performed and cholesteatoma evacuated. Openings were found in external semi-circular canal and in the oval window discharging dirty fluid. Drainage was established. A second lumbar puncture showed gram + and gram - bacilli, and gram + cocci. The mastoid and inner ear secretion showed *Streptococcus pyogenes* and a diphtheroid bacillus. Lumbar puncture was performed on several occasions, and anti-streptococcic serum was injected into the spinal canal and subcutaneously. Gradual improvement and ultimate recovery resulted.

Drs. STODDART, BARR, and SYME discussed the cases.

Abstracts.

NOSE.

Walter, W.—*A Study of the Bacterial Flora of the Nasal Mucosa in the Presence of Rhinitis.* "Journ. Amer. Med. Assoc.," September 24, 1910.

The author concludes that the diphtheroids, especially the *Bacillus segmentosus*, are concerned in producing common colds. *Micrococcus catarrhalis* is more common in its manifestation, and it seems likely that a mixed infection of these two types increases the virulence. Friedländer's pneumo-bacillus is more concerned in chronic conditions, and is probably identical with the ozæna bacillus. As regards locality, Fränkel's pneumococcus flourishes in any part of the upper respiratory tract; *B. segmentosus* in the nose, seldom in the trachea, and may cause otitis media. *M. catarrhalis* is most apt of all to invade the larynx and trachea. Pneumo-bacillus is mostly confined to the nose and sinuses. Influenza bacilli are conspicuous by their absence, and pyogenic cocci are non-pathogenic locally, except as secondary invaders. *Macleod Yearsley.*

Chamberlain, W. B.—*Non-Suppurative Ethmoiditis.* "Interstate Med. Journ.," November, 1910, p. 880.

In a review of the recent literature on this subject the author comes to the following conclusions: (1) Hyperplastic ethmoiditis can exist without pus; (2) there may be no physical signs except the thickened mucous membrane on the outer wall of the middle turbinal; (3) when this condition, together with the subjective symptoms, exists it is an indication for opening the ethmoid; (4) unless diseased, the middle turbinal should not be sacrificed but fractured at its base; (5) removal of the contents of the ethmoid labyrinth should only be practised under full vision and controlled by the nasal sound. *Macleod Yearsley.*

Clark, J. Payson.—*Two Unusual Cases of Disease of the Maxillary Antrum.* "Boston Med. and Surg. Journ.," September 8, 1910.

Both women, one aged thirty and one thirty-two. The former had frequent attacks of what she called "cold in the head" and nasal obstruction. She showed left deviation of the septum, with turbinal swelling and polypoid tissue in the left middle turbinal region. This was removed and a Watson-Gleason operation done on the septum. Improvement. One year later fresh symptoms drew attention to the maxillary antrum on the left. Washing out brought away oyster-like masses of mucus from both antra, which recurred. The case seems to have succumbed to repeated antral washings.

The second case was somewhat similar.

Macleod Yearsley.

Stuart-Low, W.—*Malignant Disease of the Nasal Passages, its Diagnosis, Pathology, and Treatment.* "Lancet," October 1, 1910.

The author considers that (1) Pain is not to be relied on as an indication of nasal malignant disease. (2) Persistent and increasing stuffiness, especially unilateral, is important in diagnosis. (3) Recurrent and increasingly severe hemorrhage, specially unilateral, is suspicious. (4) A combination of hemorrhage and increasing stuffiness is often a serious indication of new growth. (5) Early diagnosis is important. (6) It is imperative to make a thorough and systematic examination in all

obscure cases of nasal disease and to pathologically examine a removed portion of any obstruction. (7) Operation should be done as soon as a diagnosis has been made. (8) The canine fossa route is best to adopt in operating. (9) Innocent and malignant polypi are likely to co-exist.

Macleod Yearsley.

PHARYNX.

Symington, J.—*The Pharyngeal Tonsil.* "Brit. Med. Journ.," October 15, 1910.

A useful contribution to the anatomy of the naso-pharynx based mainly upon the examination of specimens in which this organ was exposed either by making median sections of the head or by means of a special dissection of the naso-pharynx from below. The author considers that the hypertrophied tonsil might conceivably cause obstruction to the Eustachian tubes by—(1) projecting downwards sufficiently far to cover over their orifices; (2) extending outwards into the fossæ of Rosenmüller and pressing against the postero-internal wall of the tube; or (3) an extension of the lymphoid growth into the lateral wall of the naso-pharynx and into the lining membrane of the tube.

Macleod Yearsley.

Yearsley, Macleod.—*An Investigation into the Occurrence of Adenoids in Three of the London County Council Elementary Schools.* "British Journal of Children's Diseases," February and March, 1910.

This investigation deals with three schools, containing 2315 children, and endeavours to ascertain the number suffering from enlarged tonsils, adenoids, or both, their relation to age, ear complications, conditions of teeth, palate shape, and aprosexia.

Results fall into two groups: Investigation A, in which only those children sent up by the teacher for colds, mouth-breathing, ear disease, or inattention were examined, and Investigation B, in which every child was examined. The latter is, of course, the more important, and in it the number examined was 1246 (667 boys and 579 girls). Of these, 56.9 per cent. were normal, 5.2 per cent. had enlarged tonsils, 10.5 per cent. had adenoids only, and 27.2 per cent. had tonsils and adenoids. One hundred and seventy-four children (13.9 per cent.) were complete or partial *mouth-breathers*, and of these, 27 (15.5 per cent.) were normal, 52 (29.3 per cent.) had adenoids, and 95 (57.5 per cent.) had adenoids and tonsils. The "normal" breathers showed various conditions of nasal obstruction due to other causes, the remaining 147 having marked adenoids. The *age-incidence* is worked out and displayed in tables and curves, which show that adenoids appear to be more common about the age of eight years, and are next most frequent at about twelve years. This is in accord with the observations of other investigators. A considerable portion is devoted to the question of *aprosexia*, and the conclusions which the author draws therefrom is that true aprosexia is often confused with apparent dulness due to defective hearing, that true aprosexia only occurs in about 4.7 per cent. of adenoid cases, is more frequent in girls, and, when present, is associated with a marked degree of adenoids. Mouth-breathing is in relative excess among the aprosexic. The *relation of palate shape* is discussed, both in regard to the presence of adenoids and to mouth-breathing, and the author concludes that the association of an abnormally high palate with adenoids is rather due to peculiarities of cranial formation than to extra-uterine influences of nasal stenosis, and

that, if there is any relation between a high narrow palate and adenoids, it is possible that the palate shape is rather a cause of adenoids than *vice versa*. In dealing with the *condition of the teeth*, it was found that 49·4 per cent. of the normal children had teeth which showed no obvious caries, and 51·4 per cent. had caries affecting from one to ten teeth, whilst of the adenoid children 40·9 per cent. had good teeth, and 59 per cent. had from one to thirteen teeth carious. It appeared, from the relation of mouth-breathing to carious teeth, that adenoids were more important than oral respiration or palate shape, a fact probably accounted for by the increased tendency to oral sepsis in adenoid children. The author also considers that irregularity of the upper incisors is less a result of adenoids than of palate-shape. Last of all, *ear complications* are dealt with. Fifty-one out of 1246 children had ear complications; that is to say, 4 per cent. of these scholars had either deafness or discharge, or both, on one or both sides, save two, who suffered from intermittent ear pain, which probably meant potential ear affection. What is of great importance was that *every single one of these children had adenoids*, and in no one normal child was there any sign or history of ear complication. The number 51, therefore, means in reality that out of 471 cases of adenoids 10·8 per cent. suffered from ear complications. This strongly emphasises the fact that the large majority of ear affections in school-children owe their existence to adenoids.

Author's Abstract.

LARYNX.

Schmiegelow, E. (Copenhagen).—*Clinical Contributions to the Pathology of Laryngeal Cancer*. "Arch. für Laryngol.," vol. xxiii, Part III.

A paper based upon 48 cases of primary laryngeal cancer from the author's own practice, of which 40 were males and 8 females. Three were under forty years of age, the youngest a man, aged twenty-eight. The starting-point of the disease was as follows: Ventricular band 5, arytenoid region 4, vocal cord 23, sinus of Morgagni 1, epiglottis 1. In 14 others the point of origin could not be determined. In three cases the growth was pedunculated and those are recorded in detail. All three originated from the arytenoid region and could not be distinguished by the laryngoscope from a pedunculated fibroma or sarcoma. The diagnosis was made by the removal of a portion for microscopic examination, and the author insists on the importance of this method in making an early diagnosis of malignant disease of the larynx. In 25 of his cases the diagnosis was established in this way and 19 were reported as typical epithelioma, 3 polypoid alveolar carcinoma, 2 adeno-carcinoma and 1 medullary carcinoma. In 3 the diagnosis was confirmed by examination of a portion removed at the operation. In the remaining 20 the diagnosis was based on clinical grounds alone, either because the disease was already far advanced or because the case was only seen once. One must not, however, place implicit confidence on the pathological report. Mistakes may arise from the presence together of a simple and a malignant growth in the same larynx, as the author found in two of his cases; or the portion removed may not go sufficiently deep into the substance of the growth to show its real character; again, quite competent pathologists have been known to make mistakes, and to pronounce a simple papilloma to be malignant or a tuberculoma to be a carcinoma.

As to treatment, 9 had no operative treatment, 6 had a simple tracheotomy, 5 were treated by endo-laryngeal methods alone, 20 by thyrotomy, 4 by partial resection, and 5 by total resection of the larynx. Of the three pedunculated growths which were removed by the cold snare followed by application of cautery, one recurred after one and a half years, one after two, and one after seven years. The author thinks these results justify endo-laryngeal treatment in cases of pedunculated growth, if the patient is kept under observation so that any recurrence can be treated at once. The recurrence after seven years was at the site of the original growth. The results of operative treatment were as follows: Of the five treated by endo-laryngeal removal all recurred except one which is reported as "cured," though less than a year had elapsed since the operation. Thyrotomy was performed in 20 cases and in 10 there has been no local recurrence, the length of time since operation varying from one and a half to seventeen years. Of the other 10, 3 died from the operation, 1 of secondary hæmorrhage, and 2 of pneumonia, and the remaining 6 all died of recurrence within a year. Of the 10 "cured" cases, 1 died after seventeen years of cancer of rectum and another after eight years of cancer of stomach. Of the four partial resections, all got over the operation but died later of recurrence, and of the total resections 1 has remained cured for twelve years, 2 died of pneumonia following operation, and 2 of recurrence.

Middlemass Hunt.

EAR.

Frazer, J. E.—*The Early Development of the Eustachian Tube and Nasopharynx.* "Brit. Med. Journ.," October 15, 1910.

A most interesting exposition of the author's views, based on his own investigations. He regards the Eustachian tube and middle-ear cavity as derived from a recess that is a part of the pharyngeal cavity and contains in its walls first, second, and probably third, arch elements. The nasopharynx is to be looked upon as a secondary enlargement of the primitive pharynx, mainly affecting its roof.

Macleod Yearsley.

Evans, J. Howell.—*Auricular and Peri-auricular Dermoids, Fistulae, and Tumours of Congenital Origin.* "The British Journal of Children's Diseases," November, 1910, p. 490.

After a concise description of the development of the external ear, the occurrence of accessory auricles, fistulae of the external ear, and cysts and tumours around the ear (classified as—[1] auricular, [a] pre-auricular, [2] peri-auricular, [b] supra-auricular, and [c] post-auricular) are discussed, and the author expresses the opinion that the rarer tumours known as congenital cholesteatomata arise in connection with the development of the otic vesicle.

Macleod Yearsley.

Richards, G. L.—*A Point in the Technique of the Use of Nitrate of Silver in the Treatment of Chronic Suppurative Otitis Media.* "Boston Med. and Surg. Journ.," September 8, 1910.

The author advocates the following method: Cleanse the suppurative area by syringing, suction, wiping and removing all polypi and *debris*. Enlarge small perforations, if need be. Lay patient's head over so that affected ear lies uppermost and horizontal. Instil nitrate of silver solution to fill canal and allow to remain five minutes, then wipe out and insert light

wick of cotton or gauze. Begin with 3 per cent. solution, increasing gradually to 20 per cent. if necessary. Repeat every other day to once a week.

Macleod Yearsley.

Sewell, Lindley.—*A Case of Chronic Suppurative Otitis Media with Labyrinthine Fistula and Spontaneous Nystagmus.* "Brit. Med. Journ.," November 12, 1910, p. 1524.

Occurred in a woman, aged twenty-four. The fistula was in the region of the external horizontal canal and was left untouched at the radical mastoid operation performed. Complete recovery resulted.

Macleod Yearsley.

Mathewson, G. H. (Montreal).—*Mastoiditis in Infants.* "Dominion Med. Monthly," September, 1910.

The author contends that there are air-cells in the infantile mastoid and that some of them are as large as in some adult mastoids. He cites fourteen cases, varying in age from four to twenty months. (Mathewson's paper is not convincing, and he appears to have mistaken the limitrophic cells of Broca for mastoid cells.—M. Y.)

Macleod Yearsley.

REVIEWS.

Hints for the General Practitioner in Rhinology and Laryngology. By Dr. JOHANN FEIN, Privatdocent at the University of Vienna. Translated by J. BOWRING HORGAN, M.B., B.Ch. With 40 figures in the text and 2 photographic plates. London: Rebman, Ltd., 1910.

It has been said that a little learning is a dangerous thing. But it can be very useful if imparted with judgment and applied with conscientiousness and discretion. The general practitioner is often tempted to say, "I know nothing about the nose and the larynx," or he may run to the other extreme and profess to know everything about them. With the increasing development of the education of the general practitioner the former position is scarcely justified, but when we consider the growing increase in the knowledge of diseases of the nose and throat, the latter is equally irrational. Dr. Johann Fein, in his "Hints for the General Practitioner in Rhinology and Laryngology," strives to demonstrate a middle course in which the interests of the general practitioner, the specialist, and, above all, the patient, are seriously studied. This book is not intended to take the place of systematic handbooks, and the different sections are classified on a clinical and practical basis. For instance, we have diseases of the nose which can be recognised and treated by anterior rhinoscopy, first without a speculum, and next with one; this is followed by a section on diseases of the nose, the recognition and treatment of which is only possible for one who has had some special technical training. The same principle is applied to diseases of the throat. Many of the headings refer to symptoms rather than to the names of diseases. Dr. Fein appears to us to under-value the general competency of the practitioner, and it seems strange to us to read that there are many doctors who, for example, believe that the turbinates are attached to the nasal septum and

that they are of cartilaginous consistence" (p. 31); also on p. 79, "the doctor is not in a position to diagnose the existence of pathological changes in the pharyngeal mucous membrane unless he has had considerable experience of such cases, or unless he is aware in any individual case that the patient's pharyngeal mucous membrane had previously presented quite a different appearance," though this latter quotation appears to us to be more thoroughly founded than the former. Among the very practical hints given we may quote (p. 90): "The patient should now be asked whether the dysphagia has been continuous, or whether it has been interrupted by painless intervals," this question helping us to decide whether the case is one of repeated attacks of angina or some continuous form of disease such as syphilis.

The statement (p. 91) that "the milky discoloration is often simulated when the examination is conducted by artificial light, but the real colour of the mucous membrane will always become apparent on examination by daylight," is one that cannot be taken too strongly to heart. We have seen its truth confirmed again and again, as also that of the statement (p. 123) that "the naso-pharynx, and especially the faucial tonsils and the posterior pharyngeal wall, may present a perfectly normal appearance, and the dysphagia may be entirely due to a localised inflammation of the pharyngeal tonsil, which can only be discovered by making an examination of this structure with the naso-pharyngeal mirror," as one to which our experience leads us heartily to subscribe. Many other such practical hints might be quoted, and we are confident that many general practitioners of medicine will be thankful to Dr. Horgan for having translated this useful work into English, while even the specialist will find in it many suggestions of value to him both in his practice and his teaching. *D. G.*

The Medical Annual, 1910. Bristol: Wright. London: Simpkin, Marshall, Hamilton, Kent & Co., Ltd.

The "Medical Annual," true to its traditions, is, in its latest issue, full of instruction. There is possibly rather less of the special element than usual, but there is an immense amount that is of interest to the specialist. Among the more noticeable special articles those on diseases of the ear, throat and nose by Drs. Milligan and Lindley Sewell will repay reading. The value of Bárány's noise producer in absolutely excluding the hearing of the sound ear is well illustrated in one quotation. Labyrinthine nystagmus is dealt with in a very excellent and condensed abstract of the various classical papers on the subject. A good account of oesophageal diverticulum is found in Dr. Robert Hutchison's abstract of Taylor's paper on the subject, while the general surgery of that tube is very tersely set forth in an abstract of a paper of Willy Meyer by Rutherford Morison. Waugh's operation for enucleation of tonsils is beautifully illustrated.

Among the less special articles we have read with profit those dealing with vaccines, Butler Harris's article entitled "An Introduction to the Treatment of Bacterial Vaccines," including the principles of immunisation of bacterial invasion and the technique of the preparation of vaccines. In the article on cancer there is a description of Leitch's rapid method of histological examination during operation, the hardening being effected by acetone, hot water, etc. Diphtheria is treated by Dr. Goodall, who draws attention to Rush's new method of staining the bacilli, and discusses the details of the operation of tracheotomy, with many details arrived at as the result of his long experience. Another article which will be read

with exceptional interest is Marshall's on syphilis in the light of recent researches in regard to the spirochaeta, the fixation of complement, etc.

Great interest attaches to the section headed "Editor's Table," in which we find the description of many medical and surgical appliances, which are all the more useful because they include the prosaic but important elements, namely the price and the place at which they can be procured. We have often had valuable hints from this chapter in the past and look forward to doing so in the future.

The only drawback to the "Medical Annual" is that whoever once starts with it will never be able to do without it. D. G.

Lehrbuch der Ohrenheilkunde (Text-book on Diseases of the Ear). By Dr. VICTOR URBANTSCHITSCH, Professor of Otology in the University of Vienna and Professor of the Royal and Imperial University Clinic for Aural Patients. Fifth and completely revised edition. 156 illustrations in the text. Pp. 622. Berlin and Vienna: Urban and Schwarzenberg, 1910.

Professor Urbantschitsch has for many years contributed items to otology in general, of which he has long been one of the most highly trusted teachers. He has, however, exhibited a taste and an original capacity for investigating many by-ways apart from the beaten track, and we therefore look in this, the new edition of his handbook, for a full exposition of the received otology, with a whole-hearted consideration of many side-issues which in other works are only lightly touched upon, if referred to. In both these respects the work before us is eminently satisfying. We have a very clear account of the elements of aural surgery, theoretical and practical, which gives the student and the teacher all the help they require. Among the less frequently studied questions we find a full and enthusiastic account of the "hearing exercises" to which the author has devoted so much attention. He discusses them as applicable in the first place to the deaf and in the second to the deaf and dumb. In the former it would seem that there is a field of usefulness which has been too much neglected and which is well deserving of our consideration. Most of us have met with cases in which although to our tests there is unquestionably evidence of increase of hearing-power under treatment, the patient, nevertheless, unfortunately finds no improvement in hearing conversation. In such cases there is every probability that methodical exercise of the hearing, with special regard to the tones, letters and syllables which are worst heard, is likely to be of value. The power of attention is often the factor which has suffered from desuetude. The limitations of the scope and the immense precaution to be exercised in the use of the method are frankly displayed, but with due care, especially in regard to over-fatigue, it may be utilised with great advantage. The book has been brought well up to date, and the reader who feels confused in regard to such questions as labyrinthine nystagmus will find his ideas on the subject much clarified by Prof. Urbantschitsch's *exposés*.

The footnotes form a store of bibliographical references to the works of writers of all nationalities. Any errors in the spelling of proper names occur in the German rather than in the English. Whether as a sole guide or as a supplement to other hand-books this work will well repay for buying, reading, binding and referring to. D. G.

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**REPORTS FOR THE YEAR 1909 FROM THE EAR AND
THROAT DEPARTMENT OF THE ROYAL INFIRMARY,
EDINBURGH.**

Under the care of A. LOGAN TURNER, M.D., F.R.C.S.E., F.R.S.E.

**I.—A CLINICAL AND BACTERIOLOGICAL STUDY OF
THIRTY-SIX CASES OF MASTOID SUPPURATION,
INCLUDING TEN CASES OF INTRA-CRANIAL COM-
PLICATION.**

BY A. LOGAN TURNER, M.D., F.R.C.S.E., F.R.S.E.,

AND

F. E. REYNOLDS, M.B., C.M.

As a detailed examination of the bacteriology of a number of our cases of middle-ear suppuration has been made by one of us (F. E. R.), it is our intention to record the results thus obtained, along with such clinical and pathological facts as seem to us to be of special interest. As the number of cases is not large, it must be understood that while certain deductions are drawn from the facts obtained, we do not wish to generalise from them. The thirty-six cases were made up as follows:

Acute middle-ear suppuration with mastoid cell abscess, 15;
chronic middle-ear suppuration with mastoid complication, 11;
intra-cranial complications of chronic middle-ear suppuration, 10.

BACTERIOLOGICAL TECHNIQUE.

It is necessary in the first instance to give a brief account of the method employed for differentiating the various organisms. Specimens for examination were obtained on sterile swabs, in every case great care being taken to prevent contamination of the material. In the majority of cases the examination was commenced on the same day as that on which the specimen was obtained. Films were made directly from the pus and were stained with Leishman's stain and by Gram's method. Examination for the tubercle bacillus was only carried out when the clinical history or the appearances found at operation raised the suspicion that tubercle might be present. A peptone broth-tube was inoculated directly from the swab, incubated at 37° C. for sixteen to twenty-four hours and then examined. This method is similar to that carried out by Lewis in his work on the bacteriology of the accessory nasal sinuses (Lewis and Logan Turner, *Edin. Med. Journ.*, April, 1910). The inoculation of a broth-tube is a very necessary procedure, possessing greater practical value than the inoculation of the surface of agar or other solid media. Many micro-organisms develop in the broth which may not be detected in the direct films, and which, from their anaërobic properties, do not develop on solid media. Among such may be mentioned *Cladothrix putridogenus*, *Bacillus fusiformis*, and the Gram-positive anaërobic bacilli so frequently present in the pus from middle-ear suppuration. Further, it has been repeatedly found that when the surface of agar is directly inoculated with the pus, either no growth takes place, or only one species of organism appears instead of several as is the case when the primary culture is made in peptone-broth.

Films were prepared from the peptone-broth culture and were stained with Leishman's stain and by Gram's method. A Petri dish containing agar, ascitic agar or ovarian agar was inoculated from the broth culture by means of a platinum spreader. From this plate or from subsequent platings the micro-organisms were obtained in pure culture. In order to ascertain whether a micro-organism had been definitely obtained in pure culture, a few isolated colonies were transferred from the plate into peptone broth and kept there for twenty-four hours at 37° C., and again plated out. This procedure was repeated at least three times in order to permit of the development of any possible contaminating organism, and thus afford a greater safeguard to the purity of the isolated organism.

The various streptococci were differentiated by the media recommended by Andrewes and Horder (*Lancet*, September, 1906), while the Gram-positive micrococci were differentiated by means of the media employed by Andrewes and Gordon (*Repts. Loc. Gov. Board*, 1903-4 and 1904-5). In identifying the Gram-negative bacilli use was made of their action on carbohydrates and on other media (MacConkey, *Journ. of Hygiene*, v, 1905, and vi, 1906). In order to identify the members of the class of capsulated bacilli, use was made of the fermentation reactions and of the ability of the organism to produce acid in particular carbohydrates, while the action on Endo's fuchsin-agar was also tested (*Russ. Centralbl. f. Bakt.*, 1906, Abt. I). The diphtheria bacillus was differentiated from the diphtheroid bacilli by the morphological and staining characters of the bacilli, by their action on litmus-milk and other media, and by Graham-Smith's fermentation tests (*Journ. of Hygiene*, vi, 1906).

A complete and systematic study of the anaërobes was not made, as it soon became evident that if this were done it would be necessary to devote all our attention to this particular line of research.

THIRTY-SIX CASES OF MIDDLE-EAR SUPPURATION REQUIRING THE MASTOID OPERATION.

These cases were subdivided clinically into three groups :

- (1) Cases of acute or recent middle-ear suppuration, with abscess in the mastoid cells, fifteen in number.
- (2) Cases of chronic or long-standing middle-ear suppuration.
 - (A) With mastoid symptoms ; eleven in number.
 - (B) With intra-cranial symptoms ; ten in number.

GROUP 1. *Acute Middle-ear Suppuration.*

The fifteen cases in the series presented certain clinical features, which, at the time of examination, appeared to us to justify their inclusion in this group. In all of them the middle-ear infection developed rapidly in connection with such acute conditions as scarlet fever, measles, influenza, severe nasal catarrh, septic tonsillitis, and in one case as the result of syringing the nose. The duration of the discharge from the ear at the time of admission to hospital varied from one week to four months, giving an average duration of five weeks for the series. The otoscopic examination

revealed the presence of a bulging tympanic membrane with small perforation in all but one of the cases, which will be referred to in greater detail presently. In eight "sagging" of the posterior meatal wall was well marked. In twelve mastoid oedema, with some projection of the auricle, was an obvious phenomenon, in six of which a subperiosteal abscess was also found.

In all of the cases the Schwartz operation was performed, the mastoid cells and the antrum being laid freely open. It must be clearly understood that the material for bacteriological examination was obtained on sterile swabs from the mastoid cavity during the operation and not from the discharge in the meatus. The following organisms were obtained: The *Streptococcus pyogenes* was found in eleven of the fifteen cases, in pure culture in four, and in the remaining seven cases in association with other organisms. Thus, a *Micrococcus pyogenes* was present in six, the *albus* variety in four, and the *aureus* in two, while in the seventh case *Bacillus proteus* and *Bacillus coli* were also found. Along with the streptococci and the *Micrococcus pyogenes* there was also noted the *Bacillus pneumoniae* (Friedländer) in one, the *Bacillus diphtheriae* in one, a diphtheroid bacillus in one, and the *Bacillus coli* in one. In the remaining four cases in the series, the *Streptococcus pneumoniae* (Fränkel's pneumococcus) was found in two, in pure culture in one, and associated with a Gram + anaërobic bacillus in the other; in the two remaining cases *Micrococcus pyogenes* var. *albus* occurred in pure culture.

If, in addition to the four cases in which the *Streptococcus pyogenes* occurred in pure culture, we regard the same organism as the virulent one in the seven cases in which it was found in association with other organisms, it becomes responsible for the mastoid complication in eleven of the fifteen cases of acute middle-ear inflammation—that is, in 73 per cent.; the *Streptococcus pneumoniae* and the *Micrococcus pyogenes* var. *albus*, on the other hand, were each responsible for two, or 13 per cent. Although the numbers are small, the predominance of the *Streptococcus pyogenes* over the other organisms is obvious, being practically in the ratio of three to one. Honda (*Passow's Beiträge*, Bd. iii, iv, i and ii) studied the bacteriology of fifty-two cases of acute otitis media, and found that the streptococci were the organisms most frequently met with, the *brevis* variety being the commonest. In all the cases in which the mastoid operation was necessary the *Streptococcus mucosus* was found. Neumann and Ruttin (*Arch. f. Ohrenheilk.*, Bd. lxxix) regarded the *Streptococcus mucosus* as the most

dangerous organism, and in twenty-four cases of acute middle-ear suppuration in which this organism was found twenty-two required a mastoid operation. There would appear to be some difference of opinion amongst bacteriologists as to whether the *Streptococcus mucosus* and the *Streptococcus pneumoniae* are identical organisms or not, or whether the *mucosus* is a sub-variety of the *Streptococcus pneumoniae*. If the two organisms are to be regarded as identical—and perhaps this is the more generally accepted opinion—then our results do not coincide with those of Honda, Neumann and Rutin, as we only found the *Streptococcus pneumoniae* in two cases in the series.

While it is obvious, both from these observations and from the experience of other writers, that the severer form of inflammation in the middle-ear cleft is associated with a variety of the streptococcus, it must not be forgotten that the anatomical conformation of the mastoid process plays an important part in the development of an abscess in the mastoid cells. This point was emphasised by Politzer many years ago. The variety of mastoid process most favourable to the development of an abscess is the pneumatic form. Attempts to differentiate the type of mastoid by percussion and the use of the X rays have not proved of great service, although greater experience in the use of the latter should prove of more service in the future. In the majority of our cases the pneumatic type of bone was found.

While the *Streptococcus pyogenes*, *Streptococcus pneumoniae* and the *Micrococcus pyogenes* var. *albus* were the common and virulent organisms in the acute mastoid abscess, they were not, as we have already pointed out, the only organisms present. The *Bacillus diphtheriae*, a diphtheroid bacillus, and the *Bacillus proteus* were each found once, and the *Bacillus coli* in two cases. While these organisms are most frequently associated with the chronic forms of suppuration, their presence in the so-called acute cases is probably to be explained by the fact that the perforation in the tympanic membrane and the discharge from the middle ear had existed for one, three, and four months in the cases in which they were found. It is, indeed, questionable whether the case in which the *Bacillus proteus* and *Bacillus coli* were associated with the *Streptococcus pyogenes* should be included amongst the acute cases. Clinically, the right ear had discharged for three months, and a swelling over the mastoid process had appeared three days before the operation; the tympanic membrane, which was bulging, presented a small perforation in its lower part. At the operation a

sub-periosteal mastoid abscess was found, the cortex of the bone was carious, and the interior of the process was also softened and carious. These organisms probably gained entrance into the middle-ear cleft through the perforation in the course of the disease, and did not form part of the original infective material entering by way of the Eustachian tube.

It is interesting to attempt a comparison, both clinically and pathologically, between the cases of streptococcal and staphylococcal origin. This has proved somewhat difficult, and it must not be forgotten that the duration of the affection plays an important part in the production both of the clinical features and of the pathological changes in and around the mastoid process. In some cases the patient was examined within forty-eight hours of the onset of acute mastoid symptoms; in others a few days or even a week had elapsed between the onset of the symptoms and the admission of the patient. We have not been able to draw a clinical picture which could be regarded as pathognomonic of the streptococcal nature of the mastoid infection, but an analysis of the symptoms and signs in these cases was significant of a more severe infection than that observed in the two staphylococcal cases. In all of the streptococcal cases the pain was evidently very considerable, the patients sleeping very little at night; in one a definite rigor had been observed, and in another there were signs suggesting the possibility of a serous meningitis. In two cases only was there any elevation of the temperature. The discharge from the ear was, as a rule, copious. In all, with one exception, there was well-marked mastoid oedema, in five of which a subperiosteal abscess was also found.

As regards the pathological conditions met with in the bone, we were able to note in three a limited destruction of the bony cortex of the process; in eleven, pus in the mastoid cells, and in five of these a "peri-sinus" abscess, the wall of the exposed sinus being covered with granulations in four of them. In the two cases in which there was no suppuration in the mastoid process, the bone was acutely inflamed without any marked softening.

In the two remaining cases in the series a pure culture of *Staphylococcus albus* was obtained from the mastoid process. In both the type of disease was of a less virulent character than in the group just described. The first was a woman who had suffered from influenza associated with pain and slight deafness in the right ear six weeks before examination; there had never been any discharge from the ear, but slight pain behind the ear had persisted

during that time. On examination, the tympanic membrane was found intact, with slight redness and swelling of the posterior superior quadrant. The hearing was slightly impaired; the tuning-fork was heard better by bone- than by air-conduction, and was lateralised from the vertex to the affected ear. There was no œdema over the mastoid process, but distinct tenderness on pressure. She was not seen again for a week; her symptoms had remained the same, but she now had slight œdema over the mastoid process and greater tenderness on pressure; there was no change in the appearance of the tympanic membrane. The temperature was 98° F. and the pulse 80. Examination of the blood revealed a leucocytosis of 14,000, with polymorphonuclear cells 71 per cent. and lymphocytes 24 per cent. The mastoid cells were opened and a small abscess was found in its lower part. There was no pus in the antrum. The bone forming the sigmoid groove was intact.

The second case was that of a boy who had complained of pain in the left ear for six or seven weeks; during the four nights previous to his admission the pain had been more severe. Although no history of discharge could be obtained a small quantity was seen in the meatus; the tympanic membrane was inflamed and there was a small perforation. Edema was well marked over the mastoid process, the auricle being displaced forwards and downwards. Slight tenderness was elicited on pressure upon the bone. Temperature was 99° F. and the pulse 100. At the operation no pus was found either under the periosteum or in the mastoid cells; the mastoid process was acutely inflamed and the bone softened.

Both these cases of staphylococcal origin had a comparatively slow course without any general disturbance, and the local pathological changes were slight, and contrasted with the appearances met with in the majority of the streptococcal group.

GROUP 2. *Chronic Middle-ear Suppuration.*

The cases in this group were twenty-one in number, the discharge from the ear varying in duration from one to twenty-one years, giving an average duration of nine years. They have been subdivided into two classes, the one (A) numbering eleven cases in which a mastoid operation was considered necessary, and the other (B) containing ten cases in which intra-cranial symptoms had developed.

(A) *Chronic Suppuration with Mastoid Complication; eleven cases.*

In this group radical operation was carried out in nine on account of the development of acute mastoid symptoms, while in two the only indication for operation was found in the existence of cholesteatoma. The acute mastoid condition was very similar to that already described in connection with the first group of cases. During a period varying from two or three to ten days before admission pain was complained of in the affected ear, and mastoid œdema, associated in some with subperiosteal abscess, supervened. Pathological changes were found in the antrum in all the cases; in addition a perforation of the mastoid cortex had occurred in five, a large sequestrum in one, and a "peri-sinus" abscess in two. Cholesteatoma was found in six of the cases. In no case was there any macroscopic evidence of labyrinthine disease. In the second class the complete mastoid operation was performed in nine as the first step in dealing with the intra-cranial complication. They will be dealt with later in detail.

The material for bacteriological examination, as in the acute cases, was obtained from the mastoid process during the performance of the radical mastoid operation, and it will be found more convenient to describe together all the organisms found in the series of chronic cases.

The *Streptococcus pyogenes*, as the probable causal organism, was found in seventeen, or in 80 per cent. of the twenty-one cases, in pure culture in two, and in combination with other organisms in fifteen. The *Streptococcus pneumoniae* occurred in two cases, or 9 per cent., also in combination with other organisms; the *Micrococcus prodigiosus* var. *albus*, in combination with the *Bacillus proteus*, was the active organism in one case, and in the last of the series a previously undescribed diplococcus, in association with *Bacillus coli*, was the responsible organism. This diplococcus, which was found in one of the cases with intra-cranial complication, will be described later.

The various organisms found in association with the above were the *Bacillus proteus* in twelve cases, the *Micrococcus prodigiosus* var. *albus* in seven, diphtheroid bacilli in four, anaërobic bacilli in four, *Bacillus coli* in two, *Bacillus pneumoniae* in two, and the *Bacillus diphtheriae*, *Bacillus pyocyaneus*, and an anaërobic coccus each in one. Attention may be drawn to the fact that spirochætæ were conspicuous by their absence in this series. In other chronic cases, not included in this paper, they have frequently been met with.

It is obvious, from a comparison of the organisms found in the acute and chronic cases, that they are of a very similar nature, not only as regards the organism probably responsible for the suppuration, but also in the manner in which they occur in combination. The explanation of this is probably to be found in the fact that in the majority of the chronic cases, as in the acute, the material for examination was obtained, not from the middle ear itself, but from the mastoid process, which was the seat of an acute exacerbation due mainly to a streptococcal infection.

An outstanding feature, however, of the chronic cases was the presence of the *Bacillus proteus* in twelve of them. In view of the relationship which is found to exist so frequently between cholesteatoma and this organism, it is interesting to note the following points: Cholesteatoma was present in twelve of the twenty-one chronic cases, and was associated with the *Bacillus proteus* in nine; in the remaining three this organism was not detected. On the other hand, the *Bacillus proteus* was present in three cases in which no cholesteatoma was found.

(B) *Ten Cases of Intra-cranial Inflammation Complicating Chronic Middle-ear Suppuration.*

The following conditions were met with in this group of cases: Purulent meningitis in five, sigmoid sinus thrombosis in four, and sinus thrombosis along with cerebellar abscess in one case. All were complications of chronic middle-ear suppuration, the duration of the aural discharge varying from six to twenty years. The right ear was affected in three, the left in seven of the cases. Five were males and five females. The youngest of the patients was seven years of age, the oldest fifty-eight; the ages of the remaining eight were twelve, seventeen, eighteen (three cases), twenty-six, twenty-nine, and thirty-two years. These figures support the well-established fact that the majority of intra-cranial complications arise in the earlier years of life. Cholesteatoma was found in the middle-ear cleft in six of the cases; in three there was no evidence of such, and in one no statement was made on this point in the notes of the case. As all of the above points were dealt with at some length in our reports for the year 1908 (JOURN. OF LARYNGOL., RHINOL., AND OTOL., July, 1909), we do not propose to again enlarge upon them here.

Involvement of the Inner Ear.—As the question of secondary infection of the labyrinth from the middle-ear cleft is at present a

prominent one, the frequency of its occurrence in the cases of intra-cranial complication demands special reference. In the ten cases in the series we have been able to obtain the following facts: In three cases the inner ear was definitely proved to be free from disease; in two of these, one of meningitis and one of sinus thrombosis, microscopic examination of the bone after death revealed no evidence of recent or past labyrinthine inflammation; in the third, a case of meningitis, the absence of clinical signs and naked-eye appearances of labyrinthine mischief, and the recovery of the patient, with complete healing of the bone-wound, was proof of a healthy inner ear. In a fourth case—sinus thrombosis—which proved fatal, the temporal bone was not examined after death, but there was no clinical or naked-eye evidence of labyrinthine complication. In the absence, however, of microscopic examination of the inner ear, no definite statement regarding its condition can be made.

In the remaining six cases the labyrinth was proved definitely to be affected. In four of them—three cases of meningitis and one of sinus thrombosis—evidence of labyrinthine suppuration was found during the mastoid operation. In the remaining two cases—one of sinus thrombosis and the other sinus thrombosis and cerebellar abscess—there was microscopic evidence in the petrous bone of previous labyrinthine disease. We are indebted to Dr. J. S. Fraser for the report on the *post-mortem* conditions of the inner ear.

If the doubtful case be eliminated we find that of nine cases of chronic middle-ear suppuration with intra-cranial complication, six, or 66 per cent., showed an associated labyrinthine condition. In other words, in five cases of meningitis, three had disease of the labyrinth, and in four cases of sinus thrombosis—one being associated with a cerebellar abscess—there was a labyrinthine condition in three.

Five Cases of Acute Lepto-meningitis Secondary to Chronic Middle-ear Suppuration.

The acute symptoms indicating an extension of the inflammation from the middle-ear cleft supervened at a varying period of time prior to the admission of the patients into hospital. In one case five days had elapsed between the onset of symptoms and the recognition of the patient's illness. As he was on admission obviously moribund no operation was attempted, death taking place

on the following day. The remaining four cases were operated upon on the day of admission, in two the duration of the acute symptoms being one week, in the third twelve days, and in the last a fortnight. Of the four cases operated upon the first two recovered and will be described in detail, while the remaining two proved fatal.

Bacteriological examination of the five cases revealed the following organisms: From the cerebro-spinal fluid of the first case, which died without operation, the *Streptococcus pneumoniae* and the anaërobic *Bacillus aerogenes capsulatus* were obtained; no swab was taken from the ear. From the two cases which recovered there was obtained from the mastoid wound of one the *Streptococcus pyogenes*, *Bacillus proteus*, and a Gram + anaërobic bacillus, and the same organisms were obtained in culture from the cerebro-spinal fluid; in the second of the two successful cases, the discharge both from the mastoid and from the inner ear yielded a growth of the *Streptococcus pyogenes*, a diphtheroid bacillus, and a Gram — saprophytic bacillus; in the cerebro-spinal fluid Gram + cocci, Gram + bacilli, and a Gram — bacillus were seen in direct films, but nothing was obtained on culture, due probably to the fact that these organisms were dead. From the two fatal cases operated upon, the organisms were, in one, the *Streptococcus pyogenes* in pure culture, both in the mastoid wound and in the cerebro-spinal fluid; while in the second, the pus from the mastoid showed in direct films Gram + cocci and Gram + bacilli, from which no growth could be obtained, as the tube was not cultured anaërobically; in the cerebro-spinal fluid Gram + cocci and a Gram + bacillus were also found in direct films. The latter, both from its morphological characters and cultural history, was found to be the *Bacillus aerogenes capsulatus*.

In the four cases operated upon the radical mastoid operation was carried out; and in three, in which there was also associated disease in the labyrinth, the semi-circular canals and vestibule were opened up and drained. In no instance was any attempt made to drain the meningeal spaces through the internal auditory meatus, but in one of the fatal cases the dura mater of the middle and posterior fossæ was incised. Lumbar puncture was carried out at intervals, and anti-streptococcic serum was injected both subcutaneously and into the spinal canal in the two successful cases in which the *Streptococcus pyogenes* was found. As the two cases which recovered presented some points of interest they are reported. The first of them was published in full in the *Edinburgh*

Medical Journal, February, 1910, but a synopsis of it is again given here.

Acute Purulent Lepto-meningitis, Complicating Chronic Middle-ear Suppuration; Radical Mastoid Operation; Repeated Lumbar Puncture and Injections of Anti-streptococcic Serum; Recovery.

W. L.—, male, aged sixteen, had had discharge from the left ear for a number of years, but had enjoyed good health until one week before his admission to hospital on November 9 when he was attacked with severe vomiting and vertigo, headache and elevation of temperature. Vomiting ceased after two days, but the headache and fever persisted. There was no history of rigor.

On admission, temperature was 100° F., pulse 68, respirations 18; tongue was furred, bowels somewhat constipated, and he complained of frontal headache. He looked ill, but answered all questions put to him quite readily.

The Ears.—Right tympanic membrane retracted; hearing good. Left ear contained fetid pus and a polypus filled the meatus. The tuning-forks were heard better by bone- than by air-conduction. The caloric vestibular tests were not carried out on account of the presence of the polypus; slight mastoid tenderness; no oedema.

The Eyes.—The pupils were equal and moderately dilated, reacting to light and accommodation; no ocular paralysis; no photophobia; no optic neuritis, but the veins in both were dilated. No spontaneous nystagmus on deviation to the healthy side (right); a few jerky nystagmic movements on deviating the eyes towards the affected ear (left).

The Nervous System.—No facial paralysis; no motor or sensory paralysis; co-ordination movements good. A slight rigidity of the neck was present. Superficial and deep reflexes were normal. Kernig's sign was not present. He readily named objects shown to him and he could read.

The Cerebro-spinal Fluid.—On lumbar puncture the fluid was under considerable pressure and slightly turbid; it contained a quantity of albumen, and after centrifuging, the clot revealed polymorphonuclear cells 40 per cent., and lymphocytes 60 per cent. No organisms were seen in direct films, and no growth was obtained in broth even after one week.

The Operation.—No pus was found in the mastoid process, the bone being devoid of definite cell spaces; the antrum contained muco-pus and cholesteatoma, as did also the aditus and attic. The roof of the antrum was carious; the dura mater appeared normal; the polypus was attached to the inner tympanic wall. The labyrinthine osseous wall showed no evidence of disease; the sigmoid sinus was not exposed. The *Streptococcus pyogenes*, *Bacillus proteus* and a Gram + anaërobe were grown from the antral secretion.

After-treatment.—For two days temperature remained elevated, reaching 102° F.; no vomiting, but severe frontal headache; 10 c.c. of anti-streptococcic serum were injected subcutaneously. On the fourth day the following clinical points were noted: Increase in neck rigidity, with pain on movement of head; Kernig's sign present on both sides; slight weakness of the movements of the left arm and hand; continued elevation of temperature. As the effects of the general anæsthetic upon the blood had probably now passed off, a blood-count was made: Leucocytosis 15,300; polymorphonuclear cells 91 per cent.

The diagnosis of meningitis was now well established, and 10 c.c. of anti-streptococcic serum were again injected subcutaneously, the injection being repeated on the following day.

A second lumbar puncture revealed the cerebro-spinal fluid under pressure and

turbid; a quantity of albumen; polymorphonuclears 70 per cent., lymphocytes 30 per cent.; a distinct deposit of pus. The following organisms having now been cultivated from the fluid, *Streptococcus pyogenes*, *Bacillus proteus* and a Gram + anaërobic bacillus—identical with those in the culture from the mastoid—a third lumbar puncture was performed and 5 c.c. of the serum were injected into the spinal canal and 5 c.c. subcutaneously. On the following day the fourth puncture was made and 10 c.c. were now injected into the canal. The cerebro-spinal fluid withdrawn at the fourth puncture contained a mere trace of albumen, a few polymorphonuclears and some lymphocytes, but no organisms could be grown from it.

During this period the patient's condition varied somewhat; he emaciated; the temperature at first fell, but again rose; leucocytosis fell to 8600, but the polymorphonuclears remained at 89 per cent.; the headache disappeared.

Three further injections of anti-streptococcic serum were given subcutaneously.

Twenty days after his admission and operation a marked improvement became manifest; the symptoms gradually disappeared, the temperature remaining consistently normal, and he began to put on weight. The mastoid cavity became dry and the patient was discharged to the Convalescent Home. Eleven months later he reported himself as being in good health.

Acute Lepto-meningitis complicating Chronic Middle-ear Suppuration and Suppuration in the Labyrinth; Removal of the Primary Focus; Repeated Lumbar Puncture and Injections of Anti-streptococcic Serum; Recovery.

J. R.—, aged twenty-nine, male, had suffered from discharge from the left ear for fifteen years. One week before his admission to hospital he had severe pain in the left ear which continued for three days. Two days before admission he vomited on three occasions; he also suffered a good deal from giddiness, finding it necessary to support himself when standing. He had had no rigors.

On the morning of admission he vomited twice; the temperature was 99° F., pulse 100; he complained of frontal headache and looked ill. He answered questions readily.

The Ears.—Right tympanic membrane normal; left ear contained foul-smelling pus, and there was some cholesteatoma-like material in the tympanum; no mastoid œdema, but tenderness on pressure. The watch was heard when pressed against the ear and also when laid upon the mastoid process. Raised voice heard at one foot. C₁₆ and C₃₂ forks were not heard by air- or bone-conduction, but the remaining forks in the series were heard better by bone than by air. The highest notes of Galton's whistle were heard. Well-marked spontaneous nystagmus on deviating the eyes to the right or healthy side; no nystagmus on looking to the left or affected side. On syringing the left (affected) ear with cold water for one and a half minutes no induced nystagmus on deviation to the right, the spontaneous nystagmus continuing. On syringing with hot water for two minutes no nystagmus induced on looking to the left; no giddiness produced. Syringing of the right ear induced well-marked normal reactions.

The Eyes.—The pupils were equal, of medium size, and reacted to light and accommodation; no ocular paralysis; no photophobia; no optic neuritis and no dilatation of the veins.

The Nervous System.—No facial paralysis; sense of smell unimpaired; co-ordination movements good; no weakness of arm or leg on either side. The superficial abdominal reflex a little less active on left than on right side; patellar reflexes present but not active; plantar flexion; Kernig's sign present on both sides. Some rigidity of the neck muscles, with pain on movement. Patient could name objects shown to him and could read well.

The other systems were normal. Examination of the blood showed a leucocytosis of 11,000.

The operation was performed on the evening of admission. The cell spaces of the mastoid process were invaded with cholesteatoma, but free of pus; a small area of the sigmoid groove was defective and the sinus wall, having a healthy appearance, was exposed. The antrum and attic contained cholesteatoma. The bone forming the roof of the attic was carious in part and a little dirty coloured fluid escaped on curetting. The external semi-circular canal had lost its ivory appearance, the bone being vascular, and in its anterior part a fistula readily admitted the end of a surgical probe. The fistula test was not carried out. On enlarging the opening a greenish-coloured fluid escaped from the canal. The stapes was absent and the probe could be passed without opposition through the oval window; the bone between the oval and round windows was removed, the external semi-circular canal freely opened, and communication established between it and the lower opening. The facial muscles twitched more than once during this stage of the operation, but no paralysis followed.

The cerebro-spinal fluid drawn off at the end of the operation was under slight pressure and turbid; alkaline in reaction, it contained a fairly large amount of albumen and it did not reduce Fehling. The deposit after centrifuging was thick and tenacious, and the films showed polymorphs, a few lymphocytes and endothelial cells all very much degenerated. No organisms could be seen in the films and no growth was obtained in culture.

After-treatment.—On the morning following the operation the patient was pretty well; the frontal headache had disappeared and he had not vomited: temperature was 99° F., pulse 70. Direct films both from the mastoid secretion and from the fluid from the external semi-circular canal showed the *Streptococcus pyogenes*, a diphtheroid bacillus and a Gram-negative saprophytic bacillus. A second lumbar puncture was made, and as the streptococcus had been found in the mastoid and inner ear, 5 c.c. of anti-streptococcal serum was injected into the spinal canal and 5 c.c. subcutaneously. The cerebro-spinal fluid withdrawn at this time was not under pressure and was less turbid than on the previous day; it contained a smaller quantity of albumen; the same degenerated cells were present. Films made from the deposit showed Gram + cocci, a few Gram + bacilli and an occasional Gram — bacillus. After three days' incubation on peptone broth, however, no growth was obtained, and agar plates inoculated from the broth gave no growth. In all probability the organisms found in direct films were dead.

On the second day after the operation the patient felt well, but there was still neck rigidity, and Kernig's sign well marked on both sides. The temperature was normal and the pulse 92. A third lumbar puncture was carried out; the cerebro-spinal fluid was almost clear and there was a trace of albumen; the cells were not nearly so numerous as before; large Gram + cocci occurring singly and a few Gram — bacilli were found, but no growth was obtained. The anti-streptococcal serum was again injected into the canal.

The further history of the case was uneventful and no subsequent injections of serum were made. On the eighth day after the operation the rigidity of the neck had disappeared and the Kernig sign was only slightly marked. The operation wound healed favourably, with the exception of a slight discharge probably from the labyrinthine opening. When he began to walk about again he had no tendency to stagger, and he could stand on either foot with his eyes shut without falling. Some nystagmus on looking to the right was still present.

Three months after the operation the caloric tests applied to the affected ear again gave no nystagmic reactions.

When a case is diagnosed as one of probable meningitis it is our practice to operate unless the patient is obviously moribund, the treatment consisting in the removal of the primary focus of suppuration, combined with an attempt to drain the affected meninges by lumbar puncture and sometimes also at the seat of the disease. In addition to this, anti-streptococcic serum was injected into the cerebro-spinal canal in the two cases just recorded. It is difficult to estimate how far serum treatment contributed to the successful result in these cases, and to what extent the earlier interference influenced the result as compared with the two fatal cases. In each the duration of the acute symptoms was one week, while in the two cases which died the symptoms had lasted twelve and fourteen days respectively. In regard to the organisms found in the two cases which recovered, the *Streptococcus pyogenes* was obtained in the mastoid in both, and in the cerebro-spinal fluid in one of them, while in the second no growth was obtained from the fluid, the Gram + cocci and bacilli which were found in direct films only being probably dead organisms. In this case the first specimen of films of cerebro-spinal fluid removed at the end of the mastoid operation contained no micro-organisms. In the second specimen, however, obtained on the day after the operation, the organisms were seen in films, but could not be grown on peptone broth in the incubator. Previous to this, no anti-streptococcic serum had been injected into the cerebro-spinal canal: we must infer that the meningeal infection was a mild one. In one of the fatal cases a pure culture of *Streptococcus pyogenes* was got both from the mastoid and from the cerebro-spinal fluid, while in the other the *Bacillus aerogenes capsulatus* was grown from the fluid in the spinal canal. The variety of organism, therefore, does not offer an explanation in these cases. Unfortunately, as a rule, patients are admitted too late, and the delay in surgical interference militates against a successful result. On the other hand, even when an early operation is performed, the case may very soon terminate fatally.

Five Cases of Sigmoid Sinus Thrombosis, one associated with Cerebellar Abscess; all complicating Chronic Middle-ear Suppuration.

All the cases in the series presented the usual clinical features associated with septic infection of the sigmoid sinus. The acute exacerbation was ushered in with rise of temperature, followed by shivering or a distinct rigor and sweating; the rigors were

repeated at varying intervals. The period between the onset of the symptoms and the date of admission to hospital varied; in one case two days and in another four days had elapsed, but in the remaining three there was a considerably longer interval. In one of them typhoid fever had been suspected, and a fortnight intervened between the first rigor and the date of operation; in the second thirteen days elapsed, and in the third the patient was ill nearly two months before admission, but there had been a remission of the symptoms until one week before operation.

As all the cases present some points of interest each will be shortly referred to.

CASE 1.—J. N.—, male, aged twenty-six, with discharge from the left ear for many years and with symptoms of two days' duration, suggesting sinus thrombosis, was admitted under the care of Mr. J. M. Cotterill, who opened the sinus and ligatured the internal jugular vein. As certain features in the case raised the suspicion of cerebellar abscess, the brain was explored behind the sinus but no abscess was found. The patient made a good recovery. Four months later he returned to hospital on account of the continuance of the discharge from his ear, along with a small septic opening in the old scar over his mastoid. A few days after his admission Mr. Cotterill transferred him to the Ear and Throat Department for the mastoid operation, and we are indebted to him for permission to refer to it. The patient seemed in good health and did not complain of headache or giddiness, and there was no history of vomiting. The brain could be felt pulsating through the gap in the skull in the site of the old cerebellar trephine wound. Pulse and temperature were normal, but it was noticed that during his short stay in hospital the pulse had been more than once under 60, and on one occasion below 50; the temperature had also touched 97° F. He was quite intelligent and answered questions readily, but he seemed to suffer from mental fatigue, because after being questioned he passed into a state in which he did not seem to be interested in what was going on about him.

The Ears.—Right ear had been the seat of past suppuration; hearing defective to watch and whispered voice. Left ear—fetid discharge with granulations in the tympanum. Deafness marked; watch negative contact; raised voice six inches. Tuning-fork on vertex lateralised to right ear; Schwabach shortened by bone. There was spontaneous horizontal nystagmus to the right; no spontaneous nystagmus to the left (affected side). Caloric tests: Syringing the left ear with hot water 110° F. for one minute produced no nystagmus on deviating the eyes to the left (affected) side; syringing with cold water and deviating the eyes to the opposite side (right) caused no increase in the spontaneous nystagmus.

The Eyes.—Pupils medium, regular, equal and reacting to light and accommodation; no ocular paralysis; spontaneous, horizontal nystagmus to the right, none to the left; discs normal, no engorgement of vessels.

Nervous System.—No headache; taste and smell normal; no facial paralysis; cutaneous sensations normal over the whole body. Co-ordination in upper limbs unimpaired; no paralysis in upper and lower extremities; hand-grasps equal; some unsteadiness when standing with the eyes closed; no hypertonus of the hamstrings; patient can name objects shown him. Abdominal reflexes present and equal on the two sides; plantar flexion on both sides, knee and Achilles' jerks active and equal. No skull tenderness.

Cerebro-spinal fluid normal.

Blood: Leucocytes, 7600; polymorphs, 87 percent.; lymphocytes 11 per cent.; red blood-corpuscles, 5,000,000, and normal in appearance.

A diagnosis of middle and inner disease on the left side was made.

Operation.—Some septic granulations were found over the occluded sigmoid sinus; the antrum and middle ear contained cholesteatoma. The labyrinth wall presented no special abnormal feature save that the external semi-circular canal had lost its natural whiteness; it was decided not to interfere with the labyrinth in the meantime and the radical mastoid operation was completed.

The progress of the case was at first satisfactory; the temperature and pulse remained normal; the patient took his food and did not vomit, but he complained occasionally of a little headache. Nothing unusual was noticed until the fifteenth day after the operation, when he vomited twice and his pulse registered 54. His discs were examined and found normal. A small quantity of cerebro-spinal fluid was withdrawn, but the examination showed nothing abnormal. At 5 p.m., without any warning, he died suddenly, with no respiratory difficulty, but apparently from sudden arrest of the heart.

At the *sectio* the left lobe of the cerebellum was found to contain a large abscess with thick, extremely fetid pus. The lateral ventricles were much distended with clear, serous fluid; there was some œdema of the cerebral tissue; no meningitis. The pus in the abscess gave cultures of the *Streptococcus pyogenes* and *Bacillus proteus*. Microscopic examination of the labyrinth revealed a subacute inflammation, with a tendency to connective-tissue formation; there was no evidence of suppuration.

The case affords another example of the suddenness of death from cerebellar abscess. The question as to whether the patient might not have an abscess in the cerebellum was discussed before the mastoid operation was carried out on account of the occasional slowing of the pulse-rate and of his tendency to become "uninterested" in his surroundings, after being questioned for a time. After the operation, however, the pulse showed no abnormality, and the patient did not develop any signs suggestive of intracranial pressure until the day of his death, though he appeared to take less interest in his surroundings than is usually the case after the mastoid operation. It is possible that the bony defect in the wall of the posterior cranial fossa, the site of the old trephine wound, may explain, to some extent at any rate, the absence of compression symptoms. The brain could be felt pulsating through this area up to the date of his death. At no time was any nystagmus observed on deviating the eyes to the affected side.

In Case 2, M. B.—, aged eighteen, female, in whom the acute symptoms developed four days before admission, with severe pain in the left ear, followed by a rigor, attention is drawn specially to two points. First, the presence of clinical signs of meningitis in a case of sigmoid sinus thrombosis, where the *post-mortem* revealed, to the naked eye at any rate, no evidence of meningitis, and

secondly, proof of the very rapid and widespread diffusion of such a fluid as collargol injected into the cerebro-spinal canal. In addition to the recurring rigors she developed clinical signs suggestive of meningitis. There was some tenderness and rigidity of the cervical muscles and Kernig's sign was present on both sides. The cerebro-spinal fluid was under pressure and slightly turbid. These signs led us to inject the spinal canal with 5 c.c. of collargol solution after the operation upon the sinus and before the patient left the operating table. Within half an hour after she had been put to bed death took place suddenly. Ether had been administered throughout the operation, and the anæsthesia had been completely recovered from. The patient had been quite conscious and had cried a good deal: there was cessation of respiration, followed in two or three minutes by arrest of the heart. At the *post-mortem* examination the pericardial sac was found to contain four to five ounces of slightly turbid fluid; the valves were healthy. When the heart was opened a few bubbles of air came through the fluid in the pericardium, suggesting that the auricles had contained some air. The pleural cavities were healthy; the lungs showed marked congestion, especially the left. The spleen was acutely congested; the liver showed cloudy swelling, and the kidneys were slightly congested.

The rapid and extensive diffusion of the collargol through the cerebro-spinal canal was a striking feature; from the lumbar region below to the optic chiasma above the meshes of the arachnoid were stained dark brown. The staining extended over the medulla, pons and interpeduncular space, and on to the lower part of the temporo-sphenoidal lobes and lateral cerebellar lobes. It had not reached the interior of the cord (Pl. I, fig. 1).

The condition of the left sigmoid sinus did not present any special feature. There was a large, foetid, "peri-sinus" abscess; the wall of the sinus had a gangrenous appearance, and its interior was almost completely filled with a clot presenting a mottled appearance and slightly adherent to the walls. The clot did not extend upwards beyond the knee, and on its removal free bleeding occurred; towards the bulb it presented a healthy, dark, plum-coloured appearance. The internal jugular vein was not ligatured. At the *post-mortem* examination the vein and its branches were found to be free from *ante-mortem* clot. The organisms grown from the "peri-sinus" abscess and from the clot in the interior of the sinus were the *Streptococcus pyogenes*, the *Micrococcus pyogenes* var. *albus*, and the *Bacillus pneumoniae*.

PLATE I.

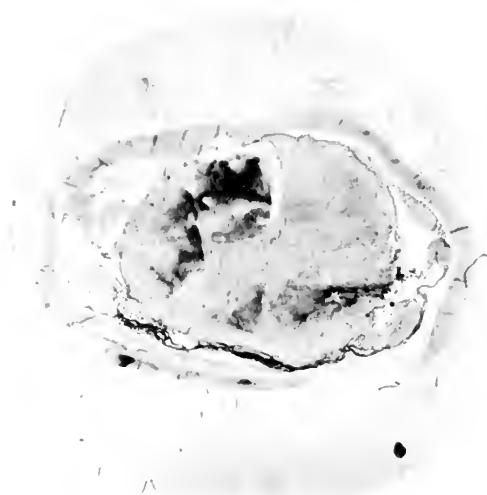


FIG. 1. Section of spinal cord showing the staining of the meshes of the pia arachnoid with collargol.

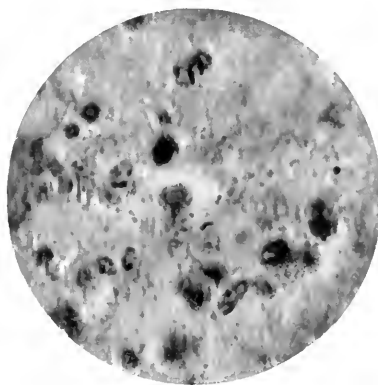


FIG. 2.—Clot from internal jugular vein showing Gram + diplococci.

TO ILLUSTRATE DR. A. LOGAN TURNER AND MR. F. E. REYNOLDS'S PAPER ON
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MASTOID SUPPURATION, INCLUDING TEN CASES OF INTRA-CRANIAL COM-
PLICATION.



FIG. 3. Pus from internal jugular vein showing diplococci.

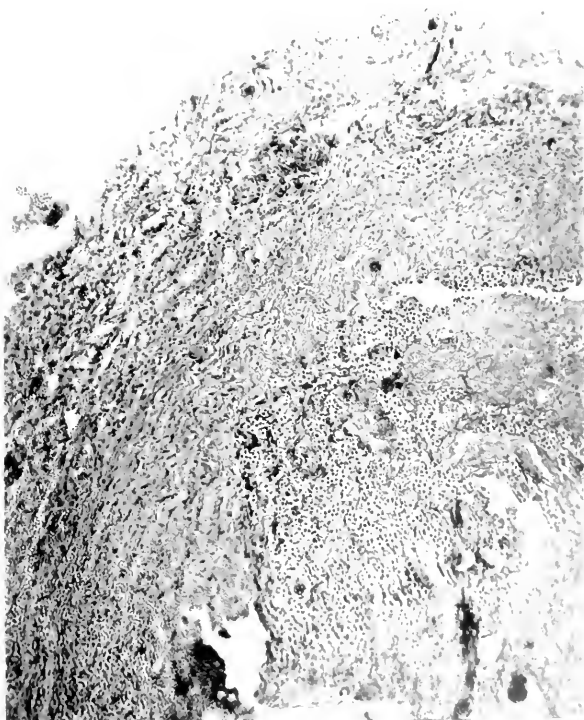


FIG. 4.—The wall of the sigmoid sinus above and on the left; the clot in the lower corner on the right.

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PLICATION.

CASE 3.—Mrs. W——, aged fifty-eight, in whom a fortnight had elapsed between the first rigor and the day of admission, illustrated one of the difficulties met with in operating late in such cases. The right internal jugular vein contained pus, almost as far down as the sterno-clavicular point, necessitating the dissection of the whole vein. Just above the junction of the vein with the subclavian vein an apparently healthy-looking clot was exposed, and the ligature was applied at this spot. Six days after the operation she had a rigor, and during the next eight days she had five further rigors, followed by death. At the *post-mortem* a broken-down septic thrombus was found below the ligature at the termination of the internal jugular vein, and the same material was present in the innominate vein. The clot in the sigmoid sinus is illustrated in Pl. II, fig. 4.

In the pus from the mastoid, the sinus, and the internal jugular vein, and from the blood in one of the veins of the forearm, a Gram + diplococcus was grown. After death the same organism was found in the veins of the thorax. This organism would appear to be a previously unnamed diplococcus. Its chief characteristics were as follows: A large Gram + coccus, occurring mostly in pairs, growing well on agar, and giving, after twenty-four hours' growth at 37° C., a raised, rounded, opaque white colony with entire border and a slightly raised centre, and with a second prominent ring round the periphery; the surface was dull and dry-looking. In size the discrete colonies measured from 1 mm. to 1.5 mm. Under a low-power microscope the colonies were finely granular and straw-coloured; they were not friable. The colonies also grew on gelatine at 20° C., and presented the same characteristics as those on agar. The following characteristics were also noted: Broth cloudy; milk clotted; no reduction of neutral red; acid production in saccharose, lactose, raffinose, and salicin. Growth on gelatine at 20° C.; morphology = *brevis*; pathogenic to mouse; no hæmolysis.

In the pus from the mastoid, sigmoid sinus, and internal jugular vein the same organism was obtained in association with *Bacillus coli*, but in the blood from the patient's forearm it was found in pure culture (Pls. I and II, figs. 2 and 3).

CASE 4.—E. O——, female, aged twelve, with discharge from the left ear since she was a baby; had a rigor thirteen days before admission; the rigors were repeated at intervals. Notwithstanding the feeble condition of the patient when admitted, operation was performed. The mastoid contained dark, foetid fluid, and a large

cholesteatomatous mass. The wall of the sinus presented a green discoloration, and through a small hole in it a foul, grumous fluid escaped; in its interior broken-down clot was found attached to the wall. Owing to the extreme weakness of the patient it was not deemed advisable to prolong the operation by ligaturing the internal jugular vein. The cerebro-spinal fluid was normal. It was evident later on that the lungs had become affected, and at the *post-mortem* examination pyæmic abscesses were found in both of them. The pus both from the mastoid and from the interior of the sinus contained the *Streptococcus pyogenes*, the *Micrococcus pyogenus* var. *albus*, and the *Bacillus proteus*. A blood-culture from a vein in the forearm also showed the *Streptococcus pyogenes* and the *Micrococcus pyogenus* var. *albus*.

CASE 5.—A. H——, male, aged seven, with a chronic discharge from the right ear; was almost a repetition of the previous case. Acute symptoms, characterised by fever and vomiting, occurred two months before admission, but apparently subsided until a week before the child came into hospital, when rigors and vomiting supervened. Notwithstanding the rapid respirations, irritable cough, and the presence of a few crepitations over the base of the left lung, it was decided to expose the sinus. The whole mastoid cortex was destroyed, and the cells contained a foul abscess. The inner ear was completely disorganised, pus oozing out both from the external semi-circular canal and from the cochlea; the bony labyrinth consisted of soft carious bone, which was readily removed with a sharp spoon. The bone forming the Fallopian canal had been destroyed, and the facial nerve lay freely exposed; there was, however, no facial paralysis. In the process of removing the diseased bone and granulations the internal auditory meatus was opened, and clear cerebro-spinal fluid escaped. The sigmoid sinus was empty with the exception of two small pieces of grey clot attached to the inner surface of the wall. Beyond the knee the sinus was found plugged with clot, and on the removal of this, free bleeding took place.

On the day following the operation the patient had a severe rigor. The respiratory difficulty increased, and two days later the child died, with extensive pulmonary involvement.

At the *post-mortem* examination a collection of pus was found in the lateral sinus between the gauze packing and the torcula. There was an excess of subarachnoid fluid. Both lungs, but especially the left, contained many embolic abscesses, and both pleural cavities contained a quantity of yellow opaque fluid with curds of lymph.

From the small grey clot in the sinus cultures of *Streptococcus pyogenes*, *Micrococcus pyogenes* var. *albus* and *Bacillus proteus* were grown, while films from the fibrinous exudate in the pleural cavities obtained after death showed streptococci and many bacilli.

If the micro-organisms found in the ten cases with intra-cranial complication be studied collectively, we find the following facts: The *Streptococcus pyogenes* was probably the virulent organism in seven of the ten cases, being found in the cerebro-spinal fluid in three of the meningitis cases, and in the sigmoid sinus in three of the cases of thrombosis. It was also found in the cerebellar abscess which was associated with sinus thrombosis. Although the clot from the sinus was not examined in this case, it is probable that the same organism had also been responsible for it. In one case of meningitis, the *Streptococcus pneumoniae* was the virulent organism. In eight cases out of ten, therefore, that is, in 80 per cent., a streptococcus was probably responsible for the complication. The figures are too small to admit of any generalisation, but they are sufficient to show the marked predominance of that organism in this series. Of the two remaining cases, one with meningitis gave a growth of *Bacillus aerogenes capsulatus* in the cerebro-spinal fluid, and from the other, with sinus thrombosis, a growth of a previously unnamed Gram + diplococcus was obtained (p. 75).

SOCIETIES' PROCEEDINGS.

PROCEEDINGS OF THE ROYAL SOCIETY OF MEDICINE—LARYNGOLOGICAL SECTION.

Meeting on Friday, January 6, 1911.

DR. P. WATSON WILLIAMS, *President, in the Chair.*

Abstract report.

The following cases, specimens, etc., were shown :

PARTY-WALL PHARYNGEAL CANCER.

BY MR. CECIL GRAHAM.

This patient was shown at the Society's meeting on May 6, 1910, by Dr. Hill.¹

¹ JOURN. OF LARYNGOL., RHINOL., AND OTOL., vol. XXV, No. 6, p. 307.

Complete laryngectomy was performed on May 14, 1910. In cutting clear of the ulcer, which involved the posterior aspect of the cricoid and part of the adjacent left pyriform fossa, the mucous membrane of the pharynx was divided transversely. The line of suture can be seen as a transverse scar. With the exception of one deep suture immediately above the trachea the wound was left completely open, being lightly filled with gauze packing. Subsequently two plastic operations were performed before there was complete healing by the end of August, 1910. A small fistula at the upper end of the wound was the last to close.

Dr. WILLIAM HILL was pleased with the excellent result and congratulated Mr. Graham upon it. When the case was shown on the previous occasion the advisability of operation was doubted, but it turned out to be quite operable. The usual quadrilateral incision was not employed, but a mesial incision, which proved to facilitate the drainage.

The PRESIDENT added his congratulations to those of Dr. Hill.

Mr. GRAHAM said that the patient seemed quite pleased with her condition, but he asked whether any simple device could be recommended to enable her to speak.

Dr. DUNDAS GRANT said that he had procured for one of his cases of total laryngectomy an instrument devised by Gottstein. This consisted of a flexible tube which fitted into the tracheotomy cannula, and which had above it a curved silver tube which was placed in the patient's mouth and was fitted with a reed which could be set in vibration by the breath. To set it in vibration it had to be blown through with considerable force, and his patient, though a vigorous adult, was unable to set it in vibration. The force of air required was much greater than the fitting of the tracheotomy tube would permit of, and the force required was also too great for the lung power. Mr. Robert H. Woods, of Dublin, invented a bellows like the bag of a bagpipe for the patient to carry under his arm, so that when he squeezed it there was enough pressure of air to produce a tone and set the reed in vibration. He exhibited a patient before the British Laryngological Association with such an instrument and apparently with a satisfactory result. If there was a fistula, a small tube with a reed could be passed through it.

CASE FOR DIAGNOSIS.

By MR. A. J. WRIGHT.

Mrs. C——, aged thirty-four. History of "soreness" in throat for about fifteen months. Slight cough, but no sputum. Swelling of arytenoids, left ventricular band, and inter-arytenoid space. No abnormal physical signs in chest. Pirquet reaction twice negative. No pyrexia or loss of weight. No improvement with iodides. Four applications of galvano-cautery in last four months, with slight improvement. Suggestions as to treatment were asked for.

Dr. DUNDAS GRANT regarded it as a case of lupus of the larynx. That would accord with the appearance, with the result of treatment, and particularly with the history, in which absence of signs of tuberculosis of the lungs was so definite.

Dr. DAN MCKENZIE agreed with Dr. Dundas Grant, and drew attention to a suspicious-looking area towards the back of the right nostril.

Dr. JOBSON HORNE said the larynx suggested tuberculosis rather than lupus.

The PRESIDENT had seen the patient in July of last year, when there was some swelling of the arytenoids and a doubtful ulcer on the right arytenoid. The patient was then having night-sweats, and had been losing flesh, and there were suspicious signs in the chest. The appearances of the larynx now were like tuberculosis.

Mr. WRIGHT, in reply, said that at first the larynx looked tuberculous. Potassium iodide in 8 gr. doses had caused swelling of the larynx after a week's administration.

DENTURE REMOVED FROM OESOPHAGUS. (SKIAGRAM ACCOMPANIED SPECIMEN.)

By Mr. NORMAN PATTERSON.

Patient, a woman, aged fifty-six, one morning, ten minutes after eating a piece of bread and butter, was astonished to find that the tooth-plate had disappeared from the roof of her mouth. She felt her neck, and it appeared to be larger than usual. Shortly after this she suffered much inconvenience from saliva collecting in her throat. There was also some pain. Laryngoscopic examination showed swelling and congestion of the arytenoid region, but no portion of the tooth-plate was visible. A skiagram was taken, and shortly afterwards, under a general anæsthetic and with the aid of the bronchoscope, no difficulty was experienced in catching hold of the plate and dragging it out of the œsophagus. The posterior edges of the plate and the hooks attached thereto, however, got caught in the anterior pillars of the fauces, and moderate traction failed to move it any further. It was therefore split up with bone forceps and then removal was easy. One interesting point about the case was that the plate lay in the œsophagus with the front or incisor portion pointing downwards. The patient made a good recovery.

Mr. HOWARTH suggested that the skiagram indicated that the denture had been lying in the hypopharynx rather than in the œsophagus proper.

Mr. N. PATTERSON, in reply, said that the upper part of the plate was in the hypopharynx, and the lower in the œsophagus.

SPECIMEN OF DEFORMITY OF THE PALATE WITH SWELLING PROVING
TO BE "PITUITARY."¹

BY MR. ALEXANDER TWEEDIE.

F. C—, aged six months, was admitted to Nottingham Children's Hospital on July 31, 1910. Examination under chloroform: Median hare-lip, cleft of which is continuous with definite central groove on anterior aspect of columella. Small pedunculated mass attached to left half of upper lip. Hard palate intact. Complete mesial cleft of soft palate, entirely occupying which was a soft (?) cystic swelling springing from the roof of the nasopharynx. No treatment considered advisable. Child died of inanition on August 6, 1910. Specimen of the whole head and neck sent to Professor Keith.

Prof. KEITH said that the head showed a median hare-lip. The nostrils were wider apart than usual, but otherwise were normal. A rounded mass, the size of the end of the little finger, could be seen through the cleft in the palate attached to the nasopharynx. The head having been dissected in such a way as to preserve the abnormality intact, it was seen that the nasal septum opened up behind as a shallow gutter or trough, inside which there was a mass of pure non-striated muscle-tissue. Mr. Shattock had suggested that this might be part of Müller's muscle of the orbit, but the speaker did not altogether agree with him. Viewed from the side the specimen showed that the infundibulum passed down from above into this trough and then was continued upwards over the mass of non-striated muscle into which it merged. The pituitary body was represented by a nodular formation in the posterior part of the septum. Into the formation of the pituitary body a bud of epithelium from the pharynx entered, passing up towards the infundibulum. In this case the pituitary body, in place of ascending within the cranium, retained the close relationship to the nasopharynx seen in a human embryo at the end of the first month of development. The same early arrest had affected the posterior part of the nasal septum, which in early life presented a trough-like expansion similar to what was visible in this specimen. Dr. Gaskell had suggested that this pharyngeal intrusion represented an old mouth with its salivary gland, but Prof. Keith himself regarded the process rather as that of an extraordinary development of a submucous gland which had some unknown connection with the formation of the central nervous system.

¹ We hope to publish a full account of this case in a later issue.

A lot of work had been done in Germany by Erdheim, Haberfeld, and others on the association of the lymphoid tissue of the naso-pharynx and the pituitary body, and it had been shown, by Killian among others, that a remnant of the pituitary bud was always present in the naso-pharynx, occupying a position above that of the pharyngeal tonsil. This was the old orifice of the pituitary body, and the connection between the pharynx and the fully formed pituitary body could be traced in many young children. This was, of course, the normal condition. Mr. J. E. Fraser, of King's College, had recently informed him that the mouth of the pituitary body, in the course of development, was carried down to the middle of the posterior edge of the septum. Erdheim had suggested the name "pharyngeal pituitary" for this, but the speaker thought some such name as "the post-nasal remnant of the pituitary" to be more fitting. He added that there seemed to be some curious relationship between the pituitary and the lymphoid tissue of the naso-pharynx.

Sir FELIX SEMON said that the mouth of the pituitary was known as Thornwaldt's bursa.

The PRESIDENT said that anomalous cases such as this were explained by the morphological facts. He had always believed that Thornwaldt's bursa was the remains of the pharyngeal part of the pituitary body, and had figured the condition in his book. The split septum was of interest in view of septal abnormalities described by Parker and others.

Dr. SCANES SPICER remarked that arrested development at the basi-sphenoid produced the same type of physiognomy as adenoids did. Some years ago he had written an article based upon Thornwaldt's original paper for the JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY, and he remembered that that author had regarded the bursa, not as the mouth of the pituitary bud, but as quite accessory, because the bursa was situated not close to, but considerably behind the nasal septum.

Dr. WM. HILL said that what was known variously as the pharyngeal pouch or bursa, or Luschka's pocket, was certainly situated low down on the posterior wall of the pharynx.

Sir FELIX SEMON, however, had seen several of these bursa higher up and quite close to the septum.

Dr. JOBSON HORNE, also, had seen specimens in which it was situated on the posterior edge of the septum relatively far distant from the usual site of the bursa.

Dr. DAVIS had seen a small hole just in front of the septum.

Dr. L. H. PEGLER had found, in cases where the bursa gave rise to symptoms, that it was impossible to remove the trouble even with repeated curettings.

The PRESIDENT thought that the discrepancies might be explained by developmental conditions. It was recognised that the position of Luschka's tonsil was shifted back with development, and in this way the displacement of the bursa took place.

EXHIBITION OF A NEW PATTERN ŒSOPHAGOSCOPIC FUNNEL WITH
EXPANDING BLADES LIKE THOSE OF A GLOVE-STRETCHER.

BY DR. WM. HILL.

It was useful in the removal of foreign bodies with sharp hooks or processes, such as the denture exhibited by Mr. Norman Patterson. By opening the blades sufficiently the foreign body could be embraced between them and the tissues protected from hooks, etc., during removal.

Mr. HOWARTH remarked that Brünings had invented a similar instrument, but—

Dr. HILL, while agreeing that the principle of expanding blades was old, pointed out that his instrument differed from that of Brünings' in several particulars.

EXHIBITION OF AN IMPROVED ŒSOPHAGO-GASTROSCOPE COMBINING
DIRECT AND INDIRECT VISION.

BY DR. WM. HILL.

This endoscope had been designed by the exhibitor in association with Dr. Herschell. The apparatus consisted essentially of three parts: (1) An elongated open endoscopic tube, 60 cm. long, on the principle of Killian's and Jackson's direct gastroscopes, which could be safely passed under direct vision all the time through the œsophagus into the stomach; (2) an indirect-vision, tubular optical apparatus, on the principle of Trouvé's polyscope, which could be safely passed through the outer direct-vision tube into the stomach; (3) an inflating apparatus for pumping air into the stomach between the inner and outer tube. The element of risk inherent in purely indirect methods of gastroscopy, which all necessarily involve blind introduction, was thus eliminated, as this gastroscope could be passed under endoscopic conditions.

CYSTIC ADENOMA OF FACIAL PAROTID GLAND.

BY MR. W. STUART-LOW.

Female, aged twenty-four, came to the hospital complaining of disfigurement and pain due to a swelling in the left pre-auricular region. The enlargement had existed for many years, and had been becoming gradually more prominent during the last three years. The pain had only been present for three weeks.

This case was shown to draw attention to what the exhibitor believed to be an important rule in treatment—viz. that seemingly innocent tumours in the parotid region should always be excised as early as possible, especially if indications such as pain and increased growth arise, since malignant changes are well known to be liable to supervene. This tendency to become malignant he considered to be accounted for by the hypomyxatous conditions normally present in the parotid gland. This was a striking contrast with the submaxillary and sublingual salivary glands, in which malignant disease primarily originating is almost unknown.

? EPITHELIOMA ON THE RIGHT PALATO-GLOSSAL FOLD IN A MAN,
AGED FORTY-EIGHT.

By MR. W. STUART-LOW.

This patient came to the hospital complaining of pain in the region of the right side of the base of the tongue and at the angle of the jaw on the same side. The pain had been felt for some weeks, and was increasing. There was a hard gland, painful on pressure, and with deep attachments at the angle of the jaw on the right side. There was no visible ulceration at the seat of pain on the palato-glossal fold, but on palpation and comparison with the other side severe pain was experienced and some induration detected. The exhibitor believed that this was an early stage of malignancy, and proposed to excise the gland for diagnosis.

Dr. JOHNSON HORNE had been unable to find any sign of malignant disease in the mouth. There was, however, an old carious molar on the same side. He advised the exhibitor to dissect out the glands and to await events.

Mr. FITZGERALD POWELL thought the case one of calculus of the submaxillary duct; he had been able to feel the calculus in the floor of the mouth.

Mr. WRIGHT agreed, and remarked that the patient complained of pain while eating—a typical sign.

Mr. STUART-LOW said that the pain felt came on after food. The tooth to which Dr. Horne had drawn attention was not carious but merely covered with tartar. The gland was not soft, but hard.

CASE OF CHRONIC TUBERCULOSIS OF THE NOSE, LARYNX, AND
LUNGS.

By MR. CHARLES A. PARKER.

The patient, a male, aged thirty-one, was first seen in May, 1909. There was then infiltration and ulceration of the right

inferior turbinal, infiltration, ulceration, and partial destruction of the epiglottis, and marked heaping up and thickening in the inter-arytenoid region and of the cords. There were physical signs of tubercle in the lungs, and tubercle bacilli were found in the sputum, mostly within the leucocytes. A section of a portion of the right inferior turbinal showed "structure usually found in lupus." After trying other methods of treatment without much result, injections of Koch's T.B. tuberculin were tried, with immediate improvement. After six months' treatment all ulceration had healed and the infiltration had disappeared, and in eight months' time the lungs showed no physical signs and the bacilli had disappeared from the sputum.

This case may be looked upon as chronic tuberculosis coming somewhere between lupus and ordinary pulmonary phthisis with laryngeal complications, and it is suggested that it is such cases that respond most readily to tuberculin injections.

CASE OF NASO-PHARYNGEAL FIBROUS POLYPUS IN A BOY, AGED
FOURTEEN.

BY DR. W. H. KELSON.

DR. H. J. DAVIS asked if the tumour was malignant.

DR. JOHNSON HORNE said that such tumours could hardly be called malignant simply because they manifested local recurrence. They extended by erosion from local pressure, and formed new connections. In this case, however, the growth seemed to be spreading outwards and to the right. The aim in operating was to get to the "mother" part of the tumour, and if this was removed there would be no recurrence.

MR. STUART-LOW had recently reported a number of these cases in the *Lancet*. The important points about operation were, to perform preliminary laryngotomy, to pack the larynx and pharynx with gauze, to have the patient propped up, to split the palate, and to remove the whole of the growth. He was compelled, in one of his cases, to interrupt the operation in order to control the free bleeding, which he did by packing with gauze soaked in adrenalin.

DR. H. J. DAVIS asked whether in dividing the palate one should go to one side of the uvula.

MR. ROSE said that, as a rule, the exact point of origin of these tumours would be found to be at the junction of the nose and the nasopharynx.

MR. FITZGERALD POWELL said that splitting the palate to one side of the uvula made no difference in suturing and had the advantage of saving the uvula. It was advisable, however, to leave the palate open in malignant cases in order that recurrence might be observed and removed early.

THE PRESIDENT had had a case in which he had found the spot of origin to be as Mr. Rose had said—at the junction of the nose and nasopharynx. In that case he had performed a modified Roux operation and had also split the palate.

Dr. KELSON said that the case had been operated on two and a half years ago and that he had now to deal with a recurrence. When removed at that time the growth had shown no sarcomatous element. Its actual point of origin seemed to lie near the orifice of the sphenoidal sinus, but it had also formed other attachments. It had then grown into the antrum, and as that cavity was now dull on transillumination it had probably progressed in the same direction on this occasion.

PAPILLOMA OF PHARYNX IN A MALE AGED FORTY-TWO.

BY DR. G. C. CATHCART.

Patient came to hospital last week complaining of hoarseness and a feeling of something in the throat, which he had noticed for some months. On examination a growth could be seen to be springing from behind the posterior pillar of the fauces on the right side, about 1 in. long, club-shaped, and rather paler than the surrounding mucous membrane.

Dr. L. H. PEGLER questioned the diagnosis of papilloma, as the surface of the tumour was quite smooth.

Mr. CLAYTON FOX thought it more likely to be a fibroma than a papilloma. He would remove it with the galvano-cautery snare.

Mr. FITZGERALD POWELL said the tumour might be composed of tonsillar tissue as it was growing out from the tonsil.

Dr. JOHNSON HORNE agreed that it was more like a fibroma than a papilloma. He had seen similar tumours attached to the inner canthus of the eye, which resembled microscopically the malignant naso-pharyngeal tumours they had just been discussing. He advised its removal with the hot-wire snare.

ULCERATION OF THE LEFT VOCAL CORD IN A MALE AGED SIXTY-SEVEN; CASE FOR DIAGNOSIS.

BY DR. G. C. CATHCART.

Patient came to hospital this week complaining of hoarseness, which interfered with his singing voice. Two years ago he had the same kind of hoarseness, but it disappeared completely. The present attack had been noticed for two months. There was no pain, no enlargement of glands, and no specific history. The laryngoscopic examination showed a small ulcer with everted edges situated at the junction of the vocal process with the true cord on the left side.

Mr. CLAYTON FOX observed that the left cord was higher than the right. The case was one of pachydermia in a singer; he could see no other cause for it.

Dr. JOHNSON HORNE thought the case of interest because it exemplified several points in the pathology to which he had drawn attention. The

indentation in pachydermia was not due to attrition of an outgrowth on one cord against the smooth surface of the other, but to the presence of outgrowths on both cords which interdigitated. He had several *post-mortem* specimens illustrating these points. In this case the hoarseness had been coming and going for five years.

The PRESIDENT also agreed with the diagnosis of pachydermia.

Mr. FITZGERALD POWELL asked that the case be shown again, as the possibility of malignancy was not altogether out of court.

MALIGNANT DISEASE OF THE PHARYNX TREATED BY RADIUM.

BY DR. SCANES-SPICER.

Dr. WM. HILL asked how long radium had been used in the case. At first sight the pharynx was not a very favourable place for the application of radium, but he had in two cases succeeded in reducing the size of the growth by its use.

Dr. FINZI said the section of the growth had shown it to be one of early epithelioma, and for this reason it was a suitable case for radium. The radium, protected by a filter-screen of $1\frac{1}{2}$ mm. of platinum on lead, had been applied for periods of fourteen hours' duration. The glands were being similarly treated. The application of radium to the pharynx had been simplified by Dr. Hill's device of tying the radium tube to an œsophageal bougie and then passing the bougie into the œsophagus. When the growth was situated in the upper pharynx the tube could be attached to a Bellocq's cannula.

DEMONSTRATION OF INSTRUMENTS FOR THE INTRA-VENOUS INJECTION OF SALVARSAN ("606").

BY DR. LIEVEN (Aix-la-Chapelle).

By the intra-venous injection abscesses and tissue-necrosis were avoided. The apparatus consisted of two elongated glass funnels, each opening into a rubber tube, which met at a two-way stop-cock, from which a single tube passed to the needle. In one tube the prepared salvarsan was placed, and in the other a quantity of normal saline. The needle having been inserted into a vein, saline was first of all run in, then the salvarsan liquid, and finally saline again. In this way contact of salvarsan with the tissues on removing the needle was prevented. In order to facilitate the penetration of a vein, a tourniquet is applied round the limb so as to distend the veins. The needle is then inserted, the appearance of blood in the glass nozzle of the needle showing that the point is in the lumen of the vessel. The tourniquet is then removed and the liquid runs in as described above.

Results of Treatment of Syphilis by Salvarsan.—The speaker considered that salvarsan would be a method of choice, but never

one of routine, first of all, because the patient had to lie up, and secondly, because he had to undergo two reactions—one three days after the injection, and the other a fortnight after.

With regard to its effects, it resembled other arsenical remedies in producing marvellous results in some cases. But he had found relapses to be frequent. The secondary roseola was slow to disappear with salvarsan, and indurated chancres persisted for a long time. Hence he did not regard the remedy as one which brought about permanent cure. In malignant syphilis, however, and when mercury was ill-borne, it was of service. Later on, say in ten or twenty years, experience would teach us whether salvarsan could be safely combined with mercury, and whether, for example, salvarsan prevented the occurrence of general paralysis and tabes.

In order to cure syphilis he could not rely on salvarsan, but would give mercury. He would, however, give the patient the former if it was desired, taking due care to guard himself against legal proceedings if it failed or proved to be harmful.

ROYAL SOCIETY OF MEDICINE—OTOLOGICAL SECTION.

Friday, January 20, 1910.

MR. A. CHEATLE, President, in the Chair.

(Abstract Report.)

The following cases and specimens were shown :

A CASE OF CEREBELLAR ABSCESS FOLLOWING OTITIS MEDIA SUPPURATIVA CHRONICA.

BY DR. W. MILLIGAN.

A. D—, male, aged twenty-four. History: Right ear had been discharging for eighteen years and was said to have followed rheumatic fever. Three weeks before admission patient had commenced to have severe headaches and occasional attacks of vomiting, bearing no relation to food; there had also been momentary attacks of giddiness, and constipation for the last few weeks.

Condition on Admission.—Rather drowsy, but able to answer questions; no staggering or uncertainty in gait; pulse 56, temperature 97° F., respirations 18. Local condition: Right meatus filled with pus, an aural polypus protruding; little pain over mastoid; patient complained chiefly of headache; marked tenderness over right side of occiput; high- and low-toned tuning-fork localised to right ear. Eyes: Nystagmus present on right lateral tension—just before operation on left; extensive optic neuritis, no squint or ptosis. Muscles: Kernig's sign present, dysdiadokokinesis marked, no muscular weakness. Reflexes: Knee-jerks increased, ankle-clonus (left), no Babinski's reflex. Cerebro-spinal fluid: Clear, under tension, no cells or organisms, albumen slightly increased.

Operation.—Radical mastoid first performed; cessation of respiration; cerebellum explored from in front of sinus; abscess found; 3ss—3j of pus. Uninterrupted recovery.

Examination of Pus.—Gram-negative diplococci and a few streptococci.

A CASE OF CEREBELLAR ABSCESS; OPERATION; RECOVERY.

BY DR. W. MILLIGAN.

N. G—, female, aged twenty. History: Right ear discharging for five years. Patient was quite well till three weeks ago, but then began with headache and vomiting; no giddiness; bowels very constipated.

Condition on Admission (April 8, 1910).—Almost comatose, unable to make any statement; pulse 60, temperature 97° F., respirations 14. Local condition: Right meatus filled with pus; perforation in post-segment of membrane; pain over mastoid, tenderness over cerebellum. Eyes: Nystagmus on right lateral tension, optic neuritis. Muscles: Kernig's sign present: impossible to estimate strength of muscles. Reflexes: Knee-jerks absent, no ankle-clonus or Babinski. Cerebro-spinal fluid: Clear, not under tension, no cells or organisms.

Operation.—Radical mastoid first performed; the cerebellum was then explored in front of the sinus and an abscess found; 3j—3ij of pus drained off; a rubber drainage-tube was inserted into the abscess. Progress: Uninterrupted recovery.

SUPPURATION OF THE LABYRINTH; FACIAL PARALYSIS; COMPLETE
"BRIDGE" OPERATION; RECOVERY.

BY DR. W. MILLIGAN.

A. U——, female, aged thirteen, was brought to hospital complaining of discharge from the right ear and occasional headaches; no vomiting, and little pain.

Condition on Admission.—The right ear was discharging slightly and the middle ear was apparently filled with granulations; the ear had been running for one year. Afterwards parents remembered that the ear had discharged in infancy. There was no marked pain or tenderness over the mastoid, but there seemed to be a little deep-seated tenderness; no tenderness on percussion over the temporal lobe or cerebellum. There was a well-marked facial paralysis affecting the right side of the face. Pulse 70, temperature 97° F., respirations 18. Eyes: No nystagmus; unable to close right eye owing to paralysis; some slight congestion of the right optic disc. Bárány's tests: All syringing tests were negative, no nystagmus being given by any of them. Hearing: Tuning-forks lateralised to left side; watch not heard on pressure. Muscles: Some marked weakness of grasp of right hand, also affecting muscles of left leg, but to less extent. No Kernig's sign. Reflexes: Knee-jerks normal, no ankle-clonus or Babinski, no plantar reflex; supinator- and biceps-jerks normal. The temperature varied between 97° and 97.6° F. during the next two days. Facial paralysis got slightly worse; other symptoms remained the same. Patient seemed rather stupid mentally. Temperature still subnormal. Just before operation nystagmus was noticed on directing eyes to the left side.

Operation.—Usual mastoid incision. On opening the mastoid cortex it was seen to be quite normal and healthy in appearance. The antrum contained a few granulations but no pus. On inspecting middle ear a few granulations were seen and curetted away. The radical mastoid operation was completed and a large flap cut; the middle ear was then again inspected and a sinus seen in the promontory, which ran into the cochlea. This opening was enlarged with a burr and a large quantity of cholesteatoma seen and removed. The facial nerve was seen to be exposed (it had been covered and pressed upon by the cholesteatoma, thus causing the facial paralysis). The semi-circular canals were then opened up above and behind the facial nerve and a probe passed through the opening

thus made and then enlarged with a fine labyrinthine burr. The bone over the middle fossa was seen to be carious, and this was removed and the temporal lobe exposed. The wound was packed lightly with gauze and left open.

After operation there was marked improvement in general condition. Temperature remained normal or about so, except for slight rise on the evening after operation. Facial paralysis gradually improving.

A CASE OF CHRONIC OTITIS MEDIA SUPPURATIVA; NECROSIS OF EXTERNAL SEMI-CIRCULAR CANAL; FISTULA FULL OF BONE GRANULATION-TISSUE; OPERATION; RECOVERY.

BY DR. W. MILLIGAN.

L. H.—, female, aged twenty-two. Ear had been discharging for the last three months; she had been deaf for many years in left ear. For the last week or so there had been pain in ear and tenderness over the mastoid. Headaches and occasional attacks of giddiness for the last two or three weeks and tendency to fall to the left side, especially when looking round quickly. Facial paralysis of a week's duration.

Condition on Admission.—Local: Left ear discharging slightly; fair-sized perforation, and pale granulation-tissue protruding through it. Marked tenderness over mastoid, especially in region of antrum and over middle fossa; no œdema. Temperature 97° F., pulse 106, respirations 26. Marked facial paralysis affecting left side of face, eye, and corner of mouth. Eyes: No marked nystagmus, but suspicion at times on right and left lateral tension; unable to close left eye; no optic neuritis. Reflexes: Knee-jerks much exaggerated; no ankle-clonus; normal plantar reflex. Bárány's tests: No fistula nystagmus; syringing with hot water, no nystagmus; syringing with cold water, slight nystagmus → right. Tuning-forks (not quite conclusive) apparently lateralised to right ear; faintly heard in left ear if held on left mastoid. Hearing: Watch not heard, even on pressure; voice just audible, though words not distinguishable.

After admission the nystagmus became more marked, but was never much; it was only present on right lateral tension. The temperature rose once or twice to 101° F.; patient had a bad cough and some bronchitis, which probably accounted for the temperature.

Operation.—Usual mastoid incision; very slight mastoid disease,

ordinary radical mastoid performed. The facial nerve was seen to be exposed, and the chorda tympani was also seen on its way to the Glasserian fissure. A large fistula was seen leading into the external canal, full of granulation-tissue; slight discharge of pus. The fistula was enlarged, and the external canal opened along its whole length. It was decided not to open up the cochlea.

Temperature and pulse both remained low after operation—temperature 97° to 98.4° F., pulse 52 to 64.

Mr. WEST asked whether the pus was examined in film or culture.

Mr. S. SCOTT asked what kind of drainage had been used in the first case, and in the case of cerebellar abscess.

The PRESIDENT asked how the drains were fixed, and what the calibre of the tubes was.

Mr. E. WAGGETT had encountered cases in which, although the primary cerebellar abscess had been opened, a secondary or accessory abscess had led to a fatal result.

Dr. H. J. DAVIS thought that gauze was a more useful drain than tubing, because it did not get blocked up.

The PRESIDENT said that Mr. Ballance drained these abscesses by removing entirely the outer wall, including the dura, so as to bring the inner wall to the surface.

Dr. MILLIGAN, in reply, said that the pus had been examined in film only. The drainage of brain abscess was always a difficulty, no matter what method was employed. He had tried all the different plans, but had come back to the tube tightly encircled with gauze; the gauze carried away the fluid and the tube the solid particles of brain-tissue, etc., from the cavity. In temporal abscesses he used two tubes, one inserted through the roof of the antro-tympanic cavity and the other through a counter-opening made through the outer side of the temporal lobe. In these cases he had used rubber tubes, the size of which was determined by the size of the opening in the bone between the lateral sinus and the internal auditory meatus. In reply to Mr. Waggett, he said he had found that multiple cerebellar abscesses were rare. Supposed secondary abscesses were generally nothing but diverticulæ in the primary abscess cavity.

Discussing further Dr. Milligan's last two cases, the PRESIDENT asked what was the type of bone found.

Mr. WEST inquired what the direction of the vertigo was in the last case, and whether the external canal was opened along its whole length and into the vestibule. Had the cavity made at the operation entirely closed?

Mr. S. SCOTT, referring to the discrepant results in testing with hot water and with cold in the last case, asked what the temperature of the hot water had been.

Dr. MILLIGAN, in reply, said that the mastoid was not infantile in any of the four cases. He did not know what had been the type of vertigo present. The external canal had been opened up to the ampulla and outer wall of the vestibule. The ear was now dry. The caloric tests had been carried out by his house-surgeon, and he was unable to give the details of the method adopted.

A CASE IN WHICH DISEASE IN A LARGE SINUS TYMPANI CAUSED
PERSISTENCE OF DISCHARGE AFTER THE RADICAL OPERATION;
CALORIC TESTS APPLIED TO THE EXPOSED INFERIOR CRUS OF THE
POSTERIOR SEMI-CIRCULAR CANAL.

BY MR. ARTHUR CHEATLE AND MR. G. J. JENKINS.

A boy, aged nine, had undergone a radical operation for chronic suppuration of the right middle ear one year previously, but the discharge persisted. A large granulation occupied the deep meatus. On opening the wound, granulation and carious bone were found in the mass of bone below the level of the external semi-circular canal; while removing this a small opening was found below the external canal and behind the descending part of the facial nerve. It was noticed by Mr. Jenkins that mopping the middle ear produced a movement of what looked like granulation-tissue, presenting at the opening. A probe was passed through the hole into a cavity, which was found to be a large sinus tympani. Thorough exposure showed the cavity reaching from the external canal above to the level of the floor of the meatus below, bounded behind by the smooth inferior crus of the posterior semi-circular canal, and passing behind and internally to the descending part of the facial nerve to the middle ear. The cavity contained granulation-tissue and inspissated pus, and the granulation which had been seen in the fundus projected from the natural opening of the sinus in the posterior wall of the middle ear.

A specimen exhibiting an identical sinus tympani in the left temporal bone of an adult was also shown. It could be noticed that the opening of the large sinus into the middle ear was extremely small.

This unusual exposure allowed of the application of the caloric test precisely to the posterior semi-circular canal.

The method adopted by Mr. Jenkins was as follows: A copper disc was welded to the end of a piece of copper wire, 1.5 mm. diameter and 5 cm. long; asbestos thread, impregnated with rubber, was wound on the wire so that only the tip of the conductor was left exposed. The instrument was placed in position, with the exposed tip of the wire resting on the posterior semi-circular canal, and the disc sprayed with ethyl chloride. The cooling was by this means rapidly produced, and immediately nystagmus appeared the instrument was removed.

The test was applied to the patient standing, with head erect

and face directed forward. The following effects were observed: Eyes directed upwards, medium to coarse vertical nystagmus. This movement was almost pure at first, but there was also a fine right to left rotatory nystagmus, which became more marked. Eyes directed downward, a coarse right to left rotatory nystagmus, with fine oblique up and to left movement. Eyes directed to the left, right to left rotatory nystagmus, with fine oblique movement; horizontal nystagmus appeared later. Eyes directed to the right, very fine, indefinite movement.

There was also marked vertigo produced, and when the tests were applied to the patient standing, with head erect and eyes shut, the following was obtained: With face forward, the patient fell backward and to the right; with face to the left, the patient fell to the right and forward; with face to the right, the patient fell backward.

Mr. SIDNEY SCOTT said that the case was unique, as the posterior canal had never before been directly examined. It was noteworthy that the nystagmus was not purely vertical, but mixed, an observation that seemed to support those who had doubted the orthodox teaching on the function of this particular canal.

Dr. DAN MCKENZIE agreed with Mr. Scott as to the case being unique. It would be unwise, he thought, to regard the mixed nystagmus as due to the action of the posterior canal alone, because it was obvious that the influence of the cold would rapidly diffuse over the whole canicular system and stimulate the other canals as well. Indeed, he regarded the initial vertical nystagmus seen when the eyes were directed upwards as tending to support the usual teaching.

Dr. GRAY remarked that the movement of the fluids under the action of the cold would render it impossible to obtain a pure result.

The PRESIDENT agreed.

A CASE OF EXOSTOSES IN THE MIDDLE EAR.

BY MR. ARTHUR CHEATLE.

A woman, aged twenty, had suppuration from the right middle ear in early life. Healing had taken place, leaving a patent perforation in the posterior segment of the membrane. A small exostosis could be seen springing from the promontory and two exostoses from the floor of the middle ear. An adhesion passed from the remains of the articular process of the incus to the head of the stapes. The stapedius tendon was unusually well seen. The remainder of the membrane was opaque.

A CASE OF LATERAL SINUS THROMBOSIS FOLLOWING ACUTE OTITIS MEDIA IN A BOY; OPERATION; RECOVERY.

BY MR. CHICHELÉ NOURSE.

The patient, a boy, aged eleven, was admitted into the Central London Throat and Ear Hospital on June 14, on account of pain and tenderness over the right mastoid region, fever, and marked general malaise. There was no mastoid swelling. The right membrana tympani was reddened and slightly bulging. The illness began eight days previously with violent pain in the right ear, persisting for forty-eight hours, and followed by slight watery discharge. The following day the temperature rose to 104.8° F. The membrane was freely incised. On June 16 a mass of adenoids was removed; after this the pain and tenderness rapidly subsided; and the boy became quite cheerful, though the temperature continued to oscillate for four days between 99° F. and 102° F. It then fell to normal, and on June 24 the patient was allowed to get up. Two days later the patient complained of severe pain below and behind the right ear, with great tenderness round the tip of the mastoid process. The neck was held stiffly in one position with the head inclined to the right; movement of the head was painful. Temperature 100° F. The next day the symptoms were more marked, there was some fulness in the neck below the mastoid. A blood-count showed leucocytosis. A cortical operation was performed. The bone was vascular. No pus was found. Blood from the antrum contained staphylococci, *Bacillus proteus vulgaris*, and Pfeiffer's bacillus. Following this the fever abated but the stiffness of the neck continued, and the patient's general condition was not good. He complained greatly when the wound was dressed, and lifted his head with both hands when he wished to change his position. Drowsiness and slowness of pulse were noted.

On July 1 there was drowsiness, slow pulse, and considerable wasting. There was much pain in the ear and extreme tenderness of the mastoid. The knee-jerks were normal, Kernig's sign was absent. Babinski extensor on the right. No nystagmus. Lumbar puncture, pressure increased, cerebro-spinal fluid clear, normal. Operation wound reopened and the lateral sinus explored; it was plugged with clot in which were a drop or two of greyish fluid. The sinus was cleared out and plugged. On July 4 an attack came on early in the morning, characterised by nausea, vertigo to

the right, nystagmus to the opposite side, distress for noises, and prostration. The pulse became slow and irregular. The symptoms ceased about noon; afterwards the patient became quite comfortable. The tuning-fork on the vertex was localised in the right ear. The following day the patient's condition was still unsatisfactory; he was more fretful; the pain in the ear and side of the head continued. The pulse was 66, there was increased leucocytosis. The middle fossa was explored, but nothing abnormal was found. The dura pulsated and there was no undue intra-cranial pressure. The dura was not incised. The bone was extremely vascular. From this date the pain and fever gradually subsided, and recovery followed.

The patient's condition was now altogether satisfactory. His hearing was good.

Mr. NOURSE, in reply to a question, added that the jugular vein had not been ligatured. No rigors had occurred during the course of the illness.

A CASE OF ACUTE INFLAMMATION OF THE MASTOID TREATED BY BIER'S METHOD.

BY DR. G. C. CATHCART.

The patient, a little girl, aged six, had been in bed for a week with influenza, when she developed pain in her left ear, for which her medical adviser prescribed some drops of carbolic and glycerine. The pain continued throughout the day, and there was tenderness and swelling over the mastoid. In the evening the temperature had suddenly shot up to 104.2° F. and the ear had just begun to discharge. Next morning the temperature was 103.8° F., and the discharge was still present. A perforation in the drum could be plainly seen, and the pain and swelling over the mastoid were most marked at the apex. Mr. West was called in in consultation, and it was agreed to apply moist heat to the mastoid and await events. That evening the temperature was still over 103° F., and the pain and swelling had not subsided. The next morning at half-past eight the temperature was 102.8° F., and the ear was so painful that the child held herself quite stiffly and shrieked if anybody approached her. A Bier's bandage was then applied, and by eleven o'clock the same day, though the swelling was increased and the discharge from it also increased, the pain behind the ear had so much decreased that the child allowed the ear to be freely handled. The drops were discontinued and nothing done

to the ear except wiping it out with a dry swab. The next day the swelling was increased owing to the congestion, but the pain did not trouble her at all. A swab was then taken and a cultivation made, when a large number of pneumococci and staphylococci were found. The same treatment was continued for a week, the bandage being put on in the morning and kept on for twenty hours. At the end of a week from this first application another swab was taken, when it was found that the pneumococci had disappeared but staphylococci were still present. As the pain and swelling had completely disappeared and the discharge was not so abundant, the bandage was then only kept on for twelve hours during the day. At the end of three weeks the ear was completely healed. Of course many cases of discharge of the ear recover without any treatment, but the remarkable thing about this case was the rapidity with which the pain disappeared after the application of the bandage.

The PRESIDENT asked what was meant by acute inflammation of the mastoid? Was it osteitis? And was Dr. Cathcart able to exclude the possibility of the symptoms being due to an enlarged gland below the mastoid?

Dr. DAN MCKENZIE drew attention to the detailed reports and criticisms of Bier's method in the treatment of suppurations of the ear which had been published in Germany and America. It had been heartily condemned because, by abolishing pain, as it had done in Dr. Cathcart's case, it tended to mask the downward progress of the disease. Moreover, it seemed to encourage the occurrence of complications, and the conclusion come to by those observers had been that the treatment should never be tried unless the case was so situated that surgical intervention could be secured at a moment's notice. This criticism did not, of course, apply to the use of Bier's treatment after the parts had been freely opened up, and in a case under his own care, where an extensive bony cavity had resulted from operation, he had used the treatment with, he thought, good effect, the cavities rapidly filling up with healthy granulations.

Mr. C. E. WEST said that in his opinion the case was one of acute otitis media, with the antrum full of exudate under pressure—the patient was suffering from acute antritis. At the time he saw the case he thought that it was one which might resolve under ordinary treatment. The relief to the pain following the Bier treatment was very striking, and he thought that Dr. McKenzie's argument that this would mask the occurrence of serious complications was untenable, because the pulse and temperature would of themselves provide sufficient warning.

Dr. FITZGERALD POWELL agreed with Mr. West. If free drainage was obtained, as in this case, no danger could result in using the Bier treatment.

Mr. S. SCOTT asked when the temperature had become normal.

Mr. WAGGETT asked what were the intervals between the bandaging and the non-bandaging.

Dr. CATHCART, in reply, said he had brought the case in order to

arouse discussion. There was no enlargement of the mastoid gland and the pain was most distinct over the antrum. If there was free discharge from the tympanum there would be no danger in using this treatment. The bandage, at first, was applied round the neck for twenty out of twenty-four hours; after the swelling had disappeared it was applied in the daytime only. If, on removing the bandage, the swelling was observed to go down, that was a sign that the treatment was doing good. The disappearance of pain was a striking and pleasant feature, and as the temperature did not fall there was no danger of any serious complications being masked. The bandage was of elastic webbing, and was wrapped round the neck once or twice, according to the room.

A CASE OF UNILATERAL DEAFNESS, PROBABLY COMPLETE, ASSOCIATED WITH VERTIGO.

BY DR. DAX MCKENZIE.

The patient, a man, aged forty-three, had been growing deaf in the right ear for two or three years. For the last fifteen months he had been afflicted with tinnitus of peculiarly distressing character, and during the same period he had experienced daily attacks of vertigo, from five minutes to two hours in duration. The vertigo, though severe, had never made him fall; it was associated with subjective movement of external objects. He had been sick and had vomited on one or two occasions. The patient complained, further, of pressure on the top of his head; he slept badly, dreaming a lot, and starting and talking in his sleep. All these symptoms have moderated lately, probably as a result of bromide.

A general survey of the patient had not disclosed any other abnormality, save the presence of a fine tremor in the tongue and a somewhat excitable tendency in the man himself. There was no sign of involvement of any of the cranial nerves, except the right auditory. There was no history of syphilis. Tested in the ordinary way, with the sound ear stopped up by the finger, the bone-conduction seemed to be only reduced in the affected ear, but when tested with the aid of Bárány's noise machine, the patient was unable to hear the tuning-fork at all in contact with the mastoid of that side.

The vestibular tests (cold caloric) worked out as follows: Right (affected) ear, slight nystagmus in ten seconds, followed by decided nystagmus in fifty seconds; vertigo. Left (sound) ear, marked nystagmus in ten seconds; vertigo.

The case was shown to illustrate the claim made for the Bárány noise machine—that it enabled us to exclude the one ear when testing the other.

The diagnosis to this case was at present uncertain. Prolonged and severe deafness in one ear only suggested, no doubt, a local rather than a systemic cause.

Mr. C. E. WEST asked whether Dr. McKenzie could offer any conjectural pathology to account for the unilateral deafness.

The PRESIDENT said that the man was exposed to noise in his occupation, and that the right ear was more exposed to it than the left, but this would not account for the tinnitus, nor for the vertigo, if the vertigo was aural.

Dr. DAN MCKENZIE said that although unilateral deafness pointed to a local lesion, he had shown a case last year in which it occurred in tabes. In the present case the tremor in the tongue, the excitable nature of the patient, and the occasional slurring of some words raised the question of general paralysis. He had found that the Bárány noise-machine sometimes lowered the normal hearing, probably owing to its demands upon the attention.

THE BACTERIOLOGY OF CHRONIC POST-NASAL CATARRH: A PRELIMINARY STUDY OF FIFTY CASES.

BY MR. C. E. WEST.

Cases of post-nasal catarrh which were not due to adenoids and had proved resistant to treatment were selected for examination. In these swelling of the area sometimes occupied by adenoids was seen, together with pallor of the mucous membrane at the orifice and under the hood of the Eustachian tube. The speaker suspected an infective factor in these cases. In order to be able to collect material from the naso-pharynx without contamination from the mouth, etc., he designed a post-nasal cannula which was inserted through the mouth and through which a stylet could be passed. Fifty cultures were taken, all from cases of chronic post-nasal catarrh upon which alkaline naso-pharyngeal douches had produced no effect. The cultures showed a striking feature in the sparsity of the number of bacterial types found. Indiscriminate mixtures of bacteria were uncommon; as a rule only two types, and sometimes only one, were obtained. Thus the *Staphylococcus aureus* was got pure in seven cases out of the fifty. The organism most frequently present was the pneumococcus, which was pure in 36 per cent., and in large proportion in 68 per cent. of the cases. In pneumococcal cases a uniform clinical appearance was observed. The disease seemed to be very chronic; the mucosa was red and glazed and showed little secretion, and there was a quadrate patch in the vault, red and somewhat pitted in appearance. Streptococci were found but seldom—a remarkable fact in view of their fre-

quency in the mouth. Streptococci were common in 24 per cent. of the cases, dominant in two, and were never found in pure culture. The same held good with regard to staphylococci, of which the *aureus* type was the most frequent. Most of the streptococci were probably due to infection from the mouth. The differentiation of staphylococci into pathogenic and non-pathogenic was not made. The *Staphylococcus aureus* was twice found pure. The Gram-cocci were neglected in the present investigation. The meningococcus was quite common. Recently four cases of cerebro-spinal meningitis had appeared at St. Bartholomew's Hospital, and the relationship of this disease to the presence of the meningococcus in the naso-pharynx was an interesting point. The *Micrococcus catarrhalis* appeared in 10 per cent. of the cases. It was found not to be a constant inhabitant, as it came and went repeatedly in the same case. Friedländer's pneumo-bacillus occurred in 12 per cent.; in 60 per cent. it was dominant. All these cases were very chronic. The sparsity of type was a fact which suggested that the bacteria were exercising a pathogenic action.

He had been trying the effect of vaccines, but with varying results. The Friedländer group proved very amenable; the catarrh got well, and cultures were free from the bacilli after the course of vaccines. The *Micrococcus catarrhalis* also quickly disappeared, but as it naturally tends to disappear this event could not be wholly referred to the action of the vaccines. The pneumococcus proved to be the most stubborn. In mixed cases the vaccination abolished all the bacteria with the exception of the pneumococcus.

In the matter of *controls* the speaker had had some difficulty in finding healthy post-nasal spaces. He found bacteria in the six control cases, as follows: In three the pneumococcus was found in pure culture, in one it was combined with the *Staphylococcus albus*; in only one case was the culture nearly sterile. Hence, bacteriologically speaking, the naso-pharynx, in health, differs but little from the naso-pharynx in chronic catarrh. Probably the personal resistance is the important factor in the situation.

The PRESIDENT, having expressed his indebtedness to Mr. West for the paper, remarked that it represented merely the preliminary of a preliminary study. He could not agree that the pallor of the mucosa at the orifice of the Eustachian tube was a sign of catarrh, seeing that this was its normal appearance.

Mr. S. SCOTT, referring to the remarks on meningococcus, said that he had examined by culture the middle-ear spaces of a child that had died of cerebro-spinal meningitis, and had found pneumo- and meningo-

cocci, and he had no doubt that these organisms might have been found in the naso-pharynx also. He also had observed the disappearance of other organisms, and the persistence of the pneumococcus after vaccination. He related a case in which nasal obstruction had proved refractory to all forms of treatment, until large doses of vaccine were tried. Then the nose became dry. This patient now had adherent and tenacious masses of mucus in the naso-pharynx, so that the vaccines had had a decided effect upon the nasal condition. He went on to say that he had often thought that the solution of the problem of whooping-cough would be found in the bacteriology of the naso-pharynx.

Dr. WATSON WILLIAMS congratulated Mr. West upon the caution with which he had drawn his conclusions. The results he had got were very similar to those of other observers, although he seemed to have found more organisms. The speaker had tried the vaccine treatment. His results had been disappointing in the case of the Friedländer bacillus, but more satisfactory in strepto- and staphylococcal infections. He referred to the absence of microscopic examination of the secretion—an important point, because slight and apparently innocuous mucous secretion in the naso-pharynx might contain virulent streptococci. In cases of post-nasal catarrh associated with disease in the posterior nasal sinuses, he relied upon drainage of the sinuses rather than upon vaccines. In meningeal affections not arising from the ear the infection often got in from the posterior ethmoidal and sphenoidal sinuses.

Mr. MARK HOVELL said that in these investigations swabs should also be taken from the nasal cavity.

Mr. FITZGERALD POWELL, referring to the suggestion of buccal infection of the post-nasal space, reminded the Section of StClair Thomson's researches on the bacteriology of the nose, which showed that the flora of the post-nasal space were usually obtained from the nose. It was also by no means uncommon to find the naso-pharynx infected from a suppurating ear. He relied upon careful and persistent treatment of the naso-pharynx by means of local applications, not douches, carefully carried out.

Mr. WEST, in reply, said that all the cases investigated were cases of deafness of the Eustachian type. Nasal suppuration was not included. He adhered to his statement that the mucous membrane of the naso-pharynx under the hood of the Eustachian tube was pale only in disease. He also adhered to his statement that in naso-pharyngeal catarrh a definite and restricted flora is present. With regard to the vaccine treatment he had resolved to try larger doses. It had a future in these cases he thought.

AMERICAN LARYNGOLOGICAL ASSOCIATION.

Thirty-second Annual Congress, held at Washington, D.C., May 3, 4, and 5, 1910.

JAMES E. LOGAN, M.D., *of Kansas City, Mo., President.*

(By courtesy of the *New York Medical Record.*)

First Day—Tuesday, May 3.

PRESIDENT'S ADDRESS.

BY DR. LOGAN.

He paid a tribute to the founders of the Association, reminding his hearers of the unfavourable conditions under which these men began their work. It had come to be recognised that the two main functions of the nasal cavities and the naso-pharyngeal space were respiration and drainage, and that nothing must be allowed to interfere with the free and proper performance of these duties. It was, of course, plainly seen that congenital deformities and the traumatism of childhood as well as accidental injuries in adult life produced conditions rendering respiration imperfect and prohibiting drainage. Hence the rhinologist had ceased merely to spray out nostrils and apply topical remedies, and had become a surgeon. Reference was made to the sudden death from accident of Dr. Gordon King, of New Orleans, an active Fellow of the Association, and a tribute was paid to his memory.

THE NASAL PHENOMENA OF NEURASTHENIA.

BY DR. CHARLES P. GRAYSON.

Recent neurology drew a rather sharp line between inherited or essential neurasthenia and that which was acquired, or more or less voluntarily assumed, and which was, indeed, scarcely more than symptomatic of an auto-intoxication exerting a pernicious effect upon the higher nerve centres. To the rhinologist there was practically little difference between the two. The nasal disorder of neurasthenia was to be differentiated from hay fever. The exciting causes of the former were different from those of the latter, and bore no relation to season, animal, or vegetable excitants, and were relieved by outdoor life, which aggravated hay-fever

cases. Excitants of the former might be central, while those of the latter were peripheral. But in the former the vasoparesis and the infiltrative tumefaction of the turbinates were at times even more accentuated, and so complete had been the vascular stasis that the incision of the œdematous turbinates have sometimes let escape a quantity of mere blood-stained serum. Such a condition as this might well account for the headache, mental apathy, and even melancholia of neurasthenia. In such cases mere cauterisation of the turbinals was insufficient. They should be first drained of their serum by multiple puncture or free scarification followed by the cautery, either chromic acid or galvanic. Internally such tonics as the glycerophosphates of lime and soda in combination with full doses of strychnine should be given.

Dr. B. R. SHURLY (Detroit) said that he had made during the last year observations on carrier pigeons after making long flights. He made sections of the spinal cord, observing under the microscope the action of fatigue, and it was possible to note an absolute change in the finer granulations of the anterior portion of the larger nerve-cells. Such a change in the human being would explain the various vaso-motor neuroses confronting us in neurasthenia. There was also an actual change in the natural secretions. The dryness in the air-passages which these neurasthenics often complain of would promptly respond to regulated doses of sheep's thyroids. Again, the exhibition of iodine was often of great value.

Dr. J. PAYSON CLARK (Boston) said that no one would feel justified in making a diagnosis of neurasthenia from nasal conditions alone. The more we knew of the latter the more cases would we be able to remove from the category of neurasthenia. In some cases he had found in both antra of Highmore a glairy mass which would come out in one piece, and the removal of which rid the patient entirely of local symptoms which were greatly affecting his general health.

Dr. R. C. MYLES (New York City) had seen such cases as Dr. Grayson described produced by sarcoma of the septum and by various sinus inflammations. In other cases there was an intumescence of the tissues relieved by surgical intervention which did not affect the sinuses. These patients did not stand operation well, and after them often became profoundly depressed. He had seen during the past winter cases of peculiar pains in the neck, thyrioid enlargements, excited hearts, etc., which the dried thyrioid had aggravated rather than relieved.

Dr. H. L. SWAIN (New Haven) thought that there was in some of these neurasthenics some anatomical conditions or physical properties in the mucous membranes differing from those of normal individuals. They had thinner-walled vessels, less fibrous connective tissue and fewer muscular elements. Given this lack of firmness in texture of the vessel wall and the hyperæsthetic nerve-endings and we had ample cause for the condition under consideration.

Dr. GRAYSON, in closing, said that many of the phenomena might be due to other conditions than neurasthenia. Various toxæmias might cause elevation of temperature, œdematous turbinates, etc., but these conditions were transient. In the class of cases described in his paper

the symptoms were continuous. They must have been due to something else than toxemia, for they had improved under general treatment while the local condition remained the same.

SOME POINTS IN THE COMPARATIVE ANATOMY OF THE LARYNX IN THE ANTHROPOIDEA.

BY DR. J. GORDON WILSON (Chicago).

This paper was based on studies of the larynges of a Chinaman, orang-outang, several *Macacus* monkeys, and a marmoset. These were compared with the larynges of a Caucasian, adult and infant, a young lion, and some of the domestic animals such as the cat, dog, and horse. In the Chinaman the characteristic features were: (1) A pouch behind the arytenoid; and (2) an anterior sinus, both of which are Simian characteristics. In the orang-outang the distinguishing features of the laryngeal ventricle and its appendages were—(1) Their union across the middle line anteriorly; (2) the pouch-like cavity posteriorly behind the arytenoid; and (3) the extra-laryngeal sacs. In the *Macacus rhesus* the floor of the ventricle was almost level with the edge of the true vocal cord, while the false cord was only slightly, if at all excavated, except where the appendix came off. Anteriorly the true and false cords approximated near the middle line. No canal or sulcus existed as in the orang-outang. On the other hand, the cords of each side were separated by a vertical median furrow which passed up into the entrance of the median sac so that a probe passed up from below and entered the sac. In the marmoset the aperture between the true and false cords was a mere slit. The ventricle came anteriorly to within 0.5 mm. of middle-line. No transverse sulcus connected them. In the *rhesus*, however, they were separated by a median longitudinal furrow. At the upper part of the median gutter lay a marked depression suggesting the opening of a median sac, but no trace of one was found on careful dissection. A probe passed up from the ventricle into the appendix reached into a small cavity in the hyoid near the middle line. The body of the hyoid was expanded, being 1 cm. broad in the middle line, and indicated the position where both the ventricles met together though they did not fuse. The second portion of the paper indicated the relation of the thyro-arytenoid muscle to the vocal cord. In connection with this subject microscopic drawings were presented and the variations traced throughout the series of animals studied. The various theories as to the functions

of the laryngeal sacs were thus given : That they acted as resonators, that they poured secretion on the vocal cords and kept them moist (Fraenkel), that they lightened the upper part of the body and assisted them (apes) in climbing (Vrolick), and that they acted as a protection (extra-laryngeal sacs in apes) for the vessels of the neck (Denker). The author stated his view that in emotional states these inert sacs could be called into play, could be distended and modified in form. Thus there could be given to vocal emission a tone of peculiar and significant intensity. It appeared to him that the characteristic cry of the howling monkeys was not intended to frighten the animals' enemies, as is generally stated, but was intended to modify the voice in order to express mental states and emotions. A monkey was capable of uttering some half-dozen sounds of different pitch. The howling was most marked during the breeding season. Regarding the appendix, the author discussed its varying size in relation to laryngocele and the lateral extra-laryngeal sacs in man. Laryngocele was an enlargement of the appendix which projected beyond the normal limits of this diverticulum, for example, into the sinus pyriformis or above the hyoid into the glosso-epiglottic fossa. The extra-laryngeal sac was an enlargement of the appendix which projected through the thyrohyoid membrane lateral, the thyrohyoid muscle, and lies under the platysma hyoids. There appeared to be sufficient evidence that certain enlargements of the appendix were pathological, *e.g.* the presence of a tumour blocking the aditus laryngis causing a dilatation of the ventricle. But in a general way all were to be classed with hernia due to a congenital or acquired weakening of the thyrohyoid membrane, and, as a consequence, dilatation subject to respiration. In a comparative study of the musculature directly related to the vocal cord the outstanding facts appeared to the author to be a gradually increasing complexity of the thyro-arytaenoid muscle and a closer approximation of it to the ligamentum vocale. The facts suggested a function directly related to the true cords and their physiological activity. They showed the development of a mechanism by which a finer or more exact control of the vocal apparatus can be obtained. The incorporation of the muscle in the cord would bring the activities of the cord under the control of the nervous system. If the sacs could be used to vary the voice in states of emotion, how much more exact, how much more capable of development, would such a muscular mechanism be ?

EXHIBITION OF ANATOMICAL PREPARATIONS DEMONSTRATING COMMUNICATION BETWEEN THE BLOOD-VESSELS SUPPLYING THE DURA, THE ORBIT, AND THE NASAL CHAMBERS.

BY DR. GEORGE E. SHAMBAUGH (Chicago).

He said that these vascular connections could be easily made out in gross dissection except that the vessels of the mucosa, of the nasal sinuses, and those of the dura and orbit required the preparation of microscopic sections. When it was shown, however, that the vessels of the dura and orbital periosteum, nasal mucosa, and sinus mucosa sent branches to supply the bony plates separating these structures, it could be assumed that connection between the two sets of vessels occurred within these plates. The author alluded to the teaching of Zuckerkandl and Killian on this subject.

THE MANIFESTATIONS OF RECURRENT INFLUENZA OF THE NOSE AND THROAT.

BY DR. J. L. GOODALE (Boston).

During the last few years his attention had been attracted to a group of cases exhibiting a well-defined symptom-complex. They had been characterised by a primary involvement in the lymphoid tissue in the pharynx or naso-pharynx, with an immediate extension of inflammatory phenomena to the mucosa of the sinuses, trachea and bronchi, with simultaneous subsidence of the inflammation in the lymphoid tissue. There was a history of annual attacks of gradually lessening mildness. Examination at the onset revealed reddening and swelling of the lymphoid follicles in the pharynx. It was important to note that the involvement of the lymphoid structures preceded any disturbance of the nose or lower air-passages. An important feature was the involvement of the ethmoidal sinuses and of a definite region of the bronchi on the affected side. It was also noted that if there was a septal deviation the middle turbinate on the concave side was more frequently involved than its fellow. The question arose, what was the pathological link existing between such attacks in the regions which predisposed them to invasion? In the nose we might have chronic hypertrophy or actual polypoid degeneration of the mucosa. In the bronchi there was no direct lesion shown by *post-mortem* findings. We might have bronchiectasis or hypertrophy of the

bronchial mucosa. It would seem, however, that we probably had a state of affairs in a definite area of the bronchi analogous to that of the involved turbinate. Out of a series of twenty cases the author had never been able to abort any of them. Application of the silver salts to the inflamed pharyngeal granules doubtfully shortened the duration of symptoms, while the sinus and bronchial stages were not influenced but came on regularly. It seemed to him that while the symptoms were increasing in intensity, transition to a colder, drier, and higher region did more harm than good. He had come to regard perfect rest at home as the best course in the first half of the affection. After the acute stage was passed and the fever had subsided, it seemed as if removal in the winter months to a warmer and moister climate gave little improvement. Patients were no better after their return than before. Local cauterisation of perhaps a single follicle in the pharynx was more beneficial to the cough than were sedatives.

Dr. W. E. CASSELBERRY (Chicago) desired to emphasise the good resulting from cauterising some one follicle or group of follicles in the pharynx. Persistent tickling and irritation were greatly relieved by this procedure. Next in order he would place cleanliness of the secretions.

Dr. J. E. LOGAN (Kansas City) had been inclined to assign the pharyngeal recesses as the place of entrance of infection in these cases. The application of a 30 per cent. solution of silver nitrate in these cases had been very successful.

Dr. GOODALE had found in his experience with the disease in his own person that crude carbolic acid answered every necessity of a cauterant, and preferred it to the silver salt. It was difficult to apply properly medicinal agents to the naso-pharynx. The upright arm of the applicator needed to be much longer than was usually the case.

QUININE AND UREA HYDROCHLORATE AS A LOCAL ANÆSTHETIC.

BY DR. E. FLETCHER INGALS (Chicago).

For a long time he had been searching for an agent that would produce prolonged anæsthesia of the mucosa for the relief of hay-fever and hyperæsthetic rhinitis. In the treatment of the latter condition he had used this anæsthetic many times before making long, deep, linear cauterisations across the inferior turbinate. He combined 15 per cent. of the urea-quinine solution with a 5 per cent. suprarenalin solution of 1:2000. He had used the same solution in the larynx, trachea, and bronchi in connection with ether anæsthesia in six bronchoscopies in children for the removal of foreign bodies from the lungs without any unpleasant results. It gave excellent results in a painful operation on the ethmoid cells.

Here it was injected submucously, diluted about fifteen times with topical application in the nares in three or four cases. He had employed it also for turbinectomies, removal of polyps and spurs, and for submucous operations. It seemed to him to act much better than did a 20 per cent. solution of cocaine in adrenalin 1:1000. In nasal neuralgia and in one case of hyperæsthetic rhinitis it did not seem to do well, as it smarted so badly. He had found that ordinarily the healthy nose would bear a 10 per cent. solution. Rubbed up with sugar of milk, a strength of 5 per cent. was as strong as could be borne in a nasal snuff. It was a very valuable anæsthetic, but he did not expect very much from it in either hay-fever or hyperæsthetic rhinitis, but in view of the claims made for it in producing prolonged anæsthesia, and in view of the old treatment of hay-fever by nasal applications of a solution of quinine, he thought it was well worthy of a trial in these affections. The solution turned to a brownish hue after a few hours, but seemed to work as well as ever, except that the activity of the adrenalin was somewhat diminished. It was better to combine the solutions just as they were to be used.

Dr. J. SOLIS-COHEN had for many years used this remedy in pernicious malarial fever. He had removed growths from the larynx with as much facility as with cocaine. He had also used it in operations in the naso-pharynx.

Dr. W. E. CASSELBERRY inquired if he had had any experience with it in laryngeal tubercle.

Dr. B. R. SHURLY had used this remedy in tonsillectomies, but its injection had been followed by considerable swelling. He had known of glottic œdema following its use.

Dr. J. E. WINSLOW had for some months done all tonsillectomies under this anæsthetic. Injection should be made of a 3 to 5 per cent. solution some fifteen to twenty minutes before operation. He had had no bad results, although there was sometimes considerable swelling. With regard to the prolongation of the anæsthesia, his experience did not bear out that of the statements of various writers.

Dr. H. L. SWAIN said that the protoplasmic death mentioned by Dr. Wilson was a most desirable thing to accomplish in laryngeal tubercle, simply from a humanitarian point of view.

Dr. SOLIS-COHEN had had under treatment a severe case of tuberculous ulcer of the larynx, and one application of a 20 per cent. solution of this anæsthetic allowed the patient to swallow for two or three days. Anæsthesia followed in two or three minutes.

Dr. INGALS, in closing, said he had had as much bleeding with this as with any other anæsthetic. He had not injected the tonsils at all. Considerable swelling had followed injection in his own cases. Most of them had prolonged anæsthesia. The first few times he had used it in the nose it did not even take down the swelling, and the bleeding was so obstinate that he had had to use adrenalin to check it.

(To be continued.)

Abstracts.

NOSE.

Taptas, M. W.—*Contribution to the Study of Rhinitis Caseosa.* "La Presse Médicale," August 17, 1910.

In this paper examples are given of two cases treated and cured. One is theoretically interesting from the presence of Loeffler's bacillus in the nose.

CASE 1.—A man, aged thirty-one. Suffered from left-sided nasal obstruction, foetid discharge, and headache. Examination showed that the right fossa was normal; the left was filled by a granulating mass bathed in pus, which bled readily on being touched.

Diagnosis.—Malignant growth. With a view to estimating the extent of the tumour and to decide on a more radical procedure, a quantity of granulations and caseous matter were removed with polyp forceps. The whole of the left ethmoidal labyrinth and inferior turbinal appeared to have been destroyed. Nothing further was done but tamponning. The next day after removal of the dressing the nose was found free from pus, and some days subsequently the parts had commenced to cicatrise. It was therefore evident that the case was one of neglected caseous rhinitis. An uninterrupted recovery ensued in a few weeks.

CASE 2.—A man, aged fifty-five, complained of a foetid discharge from the left nostril of three and a half months' duration, attributed to cold. The left maxillary antrum had been investigated by a specialist and purulent sinusitis diagnosed. No lavage had been practised. A stopped tooth had been removed, but proved to be healthy and in no way connected with the antrum. The extraction was succeeded by a rigor, with a rise of temperature to 39° C., which returned to the normal in two days. The foetid discharge continued. When seen by the author the septum nasi was much deviated to the left, and what appeared to be a trail of pus occupied the left middle meatus. The sinus was punctured and washed out; pus and caseous matter came away with the return fluid. On a further exploration of the middle meatus what had previously been considered pus turned out to be caseous matter; the latter was removed in large quantities, and amongst the cheesy material membranes in process of decomposition and calcareous deposits were observed, the latter being to the degree of simulating calculi. The patient was ordered an antiseptic ointment for the nose, and was requested to report himself again. When seen two days later the nasal discharge had almost ceased, but the nose was obstructed owing to a recent formation of false membrane between the deflected septum and the inferior turbinated body. This membrane, which was removed, contained Loeffler's bacillus in large numbers. Twenty cubic centimetres of anti-diphtheritic serum were at once administered. Two days afterwards the membrane had vanished and the nose and sinus were healthy.

The author remarks on the difficulty experienced in the diagnosis of these two cases, and the extreme benignity of the affection, removal of the caseous matter having been sufficient to ensure recovery. The caseous material acted as any other foreign body, inducing inflammation of the mucosa and secondarily of the sinus. In Case 2 Loeffler's bacilli appear to have been causal. The false membranes, having undergone decomposition, formed the nucleus of the affection. Nasal stenosis was no

doubt contributory by hindering the expulsion of the decomposed material. As to whether the disease is always due to the presence of Loettler's bacillus, which at a later period may give place to the ordinary pyogenic microbes and saprophytes which have been discovered in the *débris*, is uncertain. Anyhow, the question is raised by this case.

H. Clayton Fox.

EAR.

Tod, Hunter F.—*The Value of Ossiculectomy in Chronic Middle-ear Suppuration as a Means of Avoiding the Complete Mastoid Operation.* "Lancet," September 3, 1910.

This excellent paper deals with some 120 patients and puts the case for ossiculectomy in a very advantageous light. The number of cures was 52 per cent. and 30 per cent. were improved. The points in favour of ossiculectomy are given as: (1) The large number of cases which can be cured, or in which the mastoid operation may be avoided; (2) the large proportion in which a good result is obtained with regard to the hearing power; (3) the slight inconvenience of the operation to the patient and the short duration of the after-treatment.

Incidentally, the author advocates the performance of the Schwartz operation in certain chronic cases.

Macleod Yearsley.

Ferreri, Gherardo (Rome).—*Pathology and Situation of Otosclerosis.* "Arch. Internat. de Laryngol., d'Otol., et de Rhinol.," July, August, 1910.

Politzer holds that otosclerosis is a primary affection of the labyrinthine capsule localised principally in the neighbourhood of the oval window, the new formation taking place in the bone itself, the mucous membrane and periosteum remaining normal.

Hubermann and Katz believe that the new formation begins in the periosteum, invading the capsule of the labyrinth later.

The author agrees with Moss, Bezold, Scheibe, Politzer, Hartmann and Siebenmann that otosclerosis is a primary osseous lesion of the stapes, the oval window and the capsule of the labyrinth. Shambaugh distinguishes three distinct classes of otosclerosis:

(1) Rigidity of the stapes, osseous conduction prolonged, Rinne negative, and increased perception of deep sounds.

(2) Rigidity of the stapes accompanied by auditory symptoms, more or less marked according to the extent the labyrinthine capsule is involved. If the pathological change takes place in the neighbourhood of the vestibule there are disturbances of equilibrium.

If the cochlea is involved so are the organs of Corti. This explains how in certain typical cases of otosclerosis without rigidity of the stapes, and therefore no interference with the transmitting apparatus, the high sounds of Galton's whistle are not heard.

Bezold describes cases of otosclerosis in which the middle notes are absent. This never happens in hyperplastic or interstitial otitis.

(3) The stapes is free and the cochlea involved. These cases clinically are apt to be confused with other forms of nerve-deafness.

In the newly formed bone medullary spaces are found, in which are giant-cells with numerous nuclei.

Diabetes, arthritic tendencies, gout, neurotrophic and neuroparalytic influences, heredity, ozæna, and syphilis are mentioned as causes.

Gradenigo, Siebenmann and Habermann believe syphilis to be the chief cause, but Wassermann's reaction can decide this point.

Lucae in 37 per cent. and Bezold in 52 per cent. of cases claim a hereditary influence, and this is important from the author's point of view, as osteomalacia and rickets are hereditary maladies and much more common than syphilis; in this fact he believes there lies a prospect of successful treatment.

Where the cause of the auto-intoxication is known, treatment must be directed to the source.

During gestation parturition usually brings about a natural cure; in cases arising during lactation, however, the prognosis is not so good, owing to the neuropathic changes which take place.

The author advocates the use of Wright's diplococcic vaccine for osteomalacia, and reports favourable results from its use in otosclerosis.

Anthony McCall.

Stenger (Königsberg).—*A Contribution to our Knowledge of the Changes in the Internal Ear Consequent upon Head Injuries.* "Arch. f. Ohrenheilk.," Bd. lxxix, Heft 1 and 2, p. 43.

Stenger has been experimenting upon rats with the object of ascertaining the effect upon the structure of the labyrinth of blows upon the head, and makes this report of his results the occasion of a discussion of the whole question.

He exposed the animals to blows upon the head sufficiently severe to set up more or less concussion, but he bases his remarks only upon those individuals that recovered from the immediate effects of the injury. The others he used as controls. Twelve of the animals so treated were found to have hæmorrhage into the internal ear, whether the blows were light or severe. In those subjected to light blows the effusion of blood affected chiefly the neighbourhood of the round window and the lowest turn of the cochlea, while the vestibule and canals were free from blood. In those in whom the blows had been harder the hæmorrhage was more widespread, extending as far as the apex of the cochlea (in the scala tympani chiefly), affecting the round window markedly, and to some extent also the cochlear nerve and the canalicular ampullæ. In still severer injuries the extravasation was even more extensive: the cochlear spaces were filled with blood, the membrane of the round window was in some cases destroyed, and blood was also found among the fibres of the acoustic nerve. In several instances degenerative changes were remarked in the cells of the organ of Corti, together with certain suspicious appearances in the neurones of the spiral ganglion, but the author cautiously refrains from drawing any conclusions from these last observations, preferring to await the results of further experiment.

The chief data obtained were the hæmorrhages—(a) into the cochlear canals, beginning about the round window and extending to the apex, (b) into the ampullæ, and (c) between the fibres of the acoustic nerve, and especially of its cochlear branch and in the neighbourhood of the lamina cribrosa. In no case was there any obvious injury of the bone—that is to say, that the conditions were those of concussion of the labyrinth without actual fracture of the bony capsule.

The author then proceeds to compare his results with what has been recorded in cases of injury to the labyrinth in man. Injuries of the labyrinth may be divided into—(1) those with transverse fracture of the petrous bone involving the capsule of the labyrinth; (2) those with

longitudinal fracture of the petrous bone not involving the labyrinth;
(2) those without any evident injury of bone.

The first group, that of fracture passing through the bone of the labyrinth, is, naturally, the severest form of injury as far as the hearing is concerned. Healing, when it occurs, leaves the patient deaf, and it is a characteristic feature of this group that the hearing may get worse during the process of repair, and that persistent vertigo is not uncommon.

The other two groups have several points in common: in both the traumatism sets up hæmorrhage, most severe in the neighbourhood of the round window, because that structure is incapable of resisting sudden or violent oscillations of intra-labyrinthine fluid pressure; in both the nerve also is the seat of more or less extravasation, and in some cases the nerve-trunk itself is actually torn across.

Fracture of the petrous bone along its longitudinal axis is usually a fatal accident, but, if recovery does take place, absolute loss of hearing is uncommon unless the nerve has been seriously damaged. Indeed, in contrast with the first group, hearing may actually improve after the absorption of the effused blood.

Turning to the third group, that of damage of the labyrinth without any obvious lesion in the bone, the author points out that in severe head-injuries in which fracture does not occur, physical violence will still be conveyed along the lines at which fracture is most prone to take place, and, as one of these fracture lines traverses the labyrinth, a violent blow upon the cranium will be transmitted to the labyrinth and may induce disruption of the finer blood-vessels, nerve-fibrils, cells, and other delicate structures of the internal ear. The effects of such physical violence are evident in the lesions he found in the rats' skulls, namely, hæmorrhages, the rupture of the membrane of the round window, and of nerve-trunks or branches, changes which lead to loss of function, transitory or permanent, according to the extent and nature of the damage.

With regard to the question of the more intimate injury of the cells of the end-organ and spiral ganglion, apart from the effects of grosser lesions like hæmorrhage, etc., the author does not deny that comparatively trivial injuries may seriously damage, and even destroy, these structures. But he holds that no definite proof of the existence of such damage has ever been adduced, and that further investigation on the point is necessary.

Dan McKenzie.

Manasse, P.—*A Contribution to our Knowledge of Typhoid Deafness.*

"Arch. f. Ohrenheilk.," Bd. lxxix, Heft 3 and 4, p. 145.

Deafness appearing during the course of typhoid and other acute infectious diseases has been attributed to toxic neuritis, an explanation supported by the only case which has hitherto been examined *post mortem*. In the cases which the author has seen during the fever the deafness ended in recovery, but he has had an opportunity of examining the internal ears of a patient who suffered from severe deafness dating from an attack of typhoid fever thirty years before she died. Microscopic examination revealed chronic inflammatory changes in the vestibule together with atrophic changes in the organ of Corti, the ligamentum spirale, the ganglion spirale, the nerve-endings and in the nerve trunk itself, the lesions being most marked in and about the nerves and least marked in the organ of Corti. The position of Reissner's membrane was considerably altered; in the left ear it bulged outwards so that the

ductus cochlearis was very much dilated; in the right ear it had sunk on to the organ of Corti and the ductus cochlearis was correspondingly narrowed, changes to which little importance can be attached since they are frequent accompaniments of degenerative processes in the labyrinth from whatever cause arising.

In addition to these changes, there were present in both ears the osseous appearances typical of otosclerosis affecting the region of the anterior segment of the oval window. In spite of the obvious supposition that the atrophic changes within the labyrinth may have been secondary to otosclerosis coming on during an attack of typhoid fever, the author expresses the opinion that the affection of the labyrinth was primary and consisted in a combination of labyrinthitis and neuritis. The otosclerosis he regards as accidental.

Dan McKenzie.

Kyle, J. J. (Indianapolis).—*Some Important Ear Symptoms in General Diseases*. "Interstate Med. Journ.," November, 1910.

Comprises notes of nervous exhaustion from deafness, a condition not sufficiently appreciated; ear symptoms in arterio-sclerosis, which are sometimes the first to call attention to this disease; vaso-motor ataxia; vertigo in general diseases; differential diagnosis of labyrinthine vertigo; metastasis in ear suppuration; and the fact that a suppurating ear may cause a spread of disease, in which a case is quoted as spreading diphtheria by means of the Klebs-Loeffler bacillus found in the discharge.

Macleod Yearsley.

REVIEW.

The Treatment of Syphilis by the Ehrlich-Hata Remedy (Dioxydiamido-Arsenobenzol). A compilation of the published observations, by Dr. JOHANNES BRESLER. Second enlarged edition. (Translated by Dr. M. D. EDER, with an abstract of the most recent papers.) London and New York: Rebman, 1910.

The literature of the now-famous "606" has already reached very alarming proportions, and it is distributed in so many periodicals that it is scarcely possible for any individual reader to obtain a grasp of it from the original articles. Dr. Bresler has done his countrymen a good service by collating and condensing it for their benefit, and we have reason to be indebted to Dr. Eder for having translated the second edition into English. The author has scarcely ventured to comment on the various reports and opinions, and he apparently leaves the reader to draw his own conclusions. The general trend of opinion seems now to be in favour of the intra-venous method of administration, which, in spite of its inconvenience, seems to have the fewest disadvantages, if we may judge by the statements made by those who have practised it. Dr. Bresler quotes from critics as well as from adherents and his work is therefore of peculiar value. As it is quite moderate in bulk and in price everyone who proposes using the remedy on his own responsibility must see the advantage of possessing it.

D. G.

THE
JOURNAL OF LARYNGOLOGY,
RHINOLOGY AND OTOTOLOGY.

Original Articles are accepted by the Editors of this Journal on the condition that they have not previously been published elsewhere.

Twenty-five reprints are allowed each author. If more are required it is requested that this be stated when the article is first forwarded to this Journal. Such extra reprints will be charged to the author.

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THE JOURNAL OF LARYNGOLOGY.

THE attention of our readers is directed to the following announcement :

Drs. Macintyre, Sandford, Dundas Grant, and Milligan, who have hitherto been the proprietors and editors of the JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY, have transferred the ownership of the JOURNAL to a body of some sixty British practitioners, who have combined to form a guarantee fund for its support.

The following committee, which, it will be observed, includes the names of the previous proprietors, has been elected by the Guarantors to direct and control the policy of the JOURNAL :

Dr. THOS. BARR (Glasgow).

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Mr. MACLEOD YEARSLEY (London).

This committee has been given power to add to its number, and may, therefore, be enlarged should such a change prove to be expedient.

From the above General Committee an editorial sub-committee and a financial sub-committee have been formed. The former, which includes the Presidents of the Sections of Laryngology and Otology of the Royal Society of Medicine, will be charged with the supervision of all matter published in the JOURNAL, including the reports of the proceedings of the Otological and Laryngological Sections of the Royal Society of Medicine and of the Scottish Laryngological, Rhinological, and Otological Society. The latter will undertake the financial management of the JOURNAL.

The duties of editor will be discharged by Dr. Dan McKenzie.

At a meeting of Guarantors held in London on February 17, Dr. Watson Williams in the chair, the following resolution was unanimously adopted:

"That a hearty vote of thanks be accorded to the former proprietors of the JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY, Drs. Macintyre, Sandford, Dundas Grant, and Milligan, for their generosity in handing over the JOURNAL to the body of Guarantors."

REPORTS FOR THE YEAR 1909 FROM THE EAR AND THROAT DEPARTMENT OF THE ROYAL INFIRMARY, EDINBURGH.

Under the charge of A. LOGAN TURNER, M.D., F.R.C.S.E., F.R.S.E.

II.—STATISTICAL TABLES.

BY W. T. GARDINER, M.B., CH.B.,
Senior Clinical Assistant.

THESE tables are prepared for the purpose of tabulating the various affections of the nose, ear and throat which were observed during the examination of the patients, irrespective of the diagnosis which

was arrived at in each individual case. Thus, if a patient presented himself on account of discharge from the middle ear, and adenoid vegetations and deflection of the septum were also noted as present, all these conditions were entered under their respective tables. The figures tabulated are therefore considerably in excess of the actual number of patients who sought advice. The total number of new patients examined during 1909 were 2997. The method is similar to that adopted in the reports for 1908.

Eleven patients died in the wards: intra-cranial complications of chronic middle-ear suppuration accounted for eight fatalities; one case died from meningitis and subdural abscess secondary to acute frontal sinus suppuration; one child died from tuberculous meningitis, and another from acute pneumococcal infection of the larynx and trachea with extension to the bronchi and lungs.

AFFECTIONS OF THE NOSE (1111).

I. *The External Nose.*

Result of injury	7
Acute inflammation	2
Dermatitis of anterior nares and vestibule	30
Trade	1
Vasomotor affections	1
Lupus	12
Tubercular abscess	1
Specific disease	2
Sebaceous cyst of external nose	2
Tumour (simple)	1
	—
	59

II. *The Nasal Cavities.*

Deflection of septum to right	81
Deflection of septum to left	107
Irregular deflections	60
Hæmatoma of septum	5
Abscess of septum	4
Simple perforation of septum	8
Bleeding polypus of septum	2
Acute, subacute, and chronic rhinitis	109

Inferior turbinal enlargement . . .	328
Polypoid middle turbinals and nasal polypi . . .	109
"Choanal" polypi . . .	3
Atrophic rhinitis (non-fœtid) . . .	39
Atrophic rhinitis (fœtid) . . .	37
Chronic purulent rhinitis . . .	10
Membranous rhinitis . . .	2
Rhinitis sicca . . .	17
Epistaxis . . .	34
Lupus of the mucous membrane . . .	9
Syphilitic disease of nose . . .	15
Papilloma of nose . . .	1
Foreign bodies . . .	6
Nasal neuroses, including asthma and hay-fever . . .	53
Anosmia . . .	12
Congenital choanal atresia (partial) . . .	1
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	1052

ACCESSORY NASAL SINUSES (67).

Acute antral suppuration . . .	6
Chronic antral suppuration . . .	33
Acute frontal sinus catarrh . . .	1
Chronic frontal sinus suppuration . . .	2
Acute ethmoidal suppuration . . .	2
Chronic ethmoidal suppuration . . .	3
Chronic sphenoidal suppuration . . .	2
Chronic fronto-maxillary suppuration . . .	1
Chronic frontal, ethmoidal, and antral suppuration . . .	2
Chronic fronto-ethmoidal suppuration . . .	1
Chronic antro-ethmoidal suppuration . . .	3
Chronic spheno-ethmoidal suppuration . . .	3
Chronic pansinusitis . . .	1
Mucocœle of frontal sinus . . .	2
Malignant disease of antrum . . .	2
Injury to ethmoidal labyrinth . . .	1
Gumma of inner orbital wall . . .	1
Antro-choanal polypus . . .	1
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	67

AFFECTIONS OF THE NASO-PHARYNX (1013).

Adenoid growths and hypertrophy of the faucial tonsils	1005
Chronic naso-pharyngeal catarrh	5
Naso-pharyngeal fibroma	1
Enlarged Eustachian cushions	2
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	1013

AFFECTIONS OF THE ORO-PHARYNX (320).

I. *Acute.*

Acute tonsillitis	41
Peritonsillar abscess	32
Acute retro-pharyngeal abscess	3
Diphtheria	4
Acute pharyngitis	21
Angina ulcerosa benigna	2
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	103

II. *Chronic.*

Bifid uvula	8
Elongated uvula	4
Chronic pharyngitis (including granular pharyngitis)	52
Keratoses of pharynx	4
Pharyngitis (sicca)	51
Syphilis (secondary, tertiary)	38
Lupus	6
Tubercle	2
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	165

III. *Tumours.*

Malignant disease of tonsil	2
Malignant disease of soft palate	1
Malignant disease of posterior pharyngeal wall	2
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	5

IV. *Miscellaneous.*

Injuries to palate	5
Foreign bodies	17
Paralysis of soft palate	2
Neuroses	23
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	47

AFFECTIONS OF THE BUCCAL CAVITY (28).

Ulcerative stomatitis	6
Cellulitis of floor of mouth	1
Acute glossitis	1
Pemphigus	1
Hypertrophy of lingual tonsil	8
Tumour of tongue	3
Cleft palate	2
Alveolar abscess	1
Dental cysts	5
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	28

AFFECTIONS OF THE LARYNX (218).

I. *Acute.*

Acute catarrhal laryngitis	24
Acute inflammatory cedema	2
Membranous laryngitis (pneumococcal)	1
Acute perichondritis	2
Acute syphilitic laryngitis (secondary)	3
Subacute laryngitis	10
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	42

II. *Chronic.*

Chronic laryngitis (catarrhal)	37
Chronic perichondritis	1
Laryngitis sicca	20
Vocal nodules	3
Lupus	2
Tubercular laryngitis	39
Tertiary syphilis	13
Pemphigus	1
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	116

III. *Tumours.*

Simple :			
Papilloma	.	.	2
Fibroma	.	.	3
Malignant :			
Intrinsic	.	.	7
Extrinsic	.	.	1
			<hr/>
			13

IV. *Affections of the Nerves.*

Hysterical aphonia	.	.	18
Abductor paralysis (left)	.	.	3
Abductor paralysis (bilateral)	.	.	4
Complete recurrent paralysis (left)	.	.	7
Complete recurrent paralysis (right)	.	.	1
Bulbar paralysis	.	.	4
Laryngismus stridulus	.	.	3
Sensory laryngeal neurosis	.	.	1
			<hr/>
			41

V. *Miscellaneous.*

Tumour of neck pressing on larynx	.	.	1
Aneurysm pressing on trachea	.	.	1
Stenosis after tracheotomy	.	.	1
Congenital laryngeal stridor	.	.	2
Cut throat	.	.	1
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			6

AFFECTIONS OF THE OESOPHAGUS (14).

Stricture :			
Spasmodic	.	.	4
Simple (cicatricial)	.	.	2
Malignant	.	.	5
Foreign body	.	.	3
			<hr/>
			14

AFFECTIONS OF THE NECK (12).

Goitre :

Simple	9
Malignant	1
Exophthalmic	1
Thyroglossal cyst	1
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	12

AFFECTIONS OF THE EAR (1559).

I. *The External Ear.*

Abscess of external ear	1
Cyst of external ear	1
Seborrhœa of auricle	18
Acute external otitis	8
Dermatitis of meatus	21
Furunculosis	36
Impetigo	2
Condyloma	1
Foreign bodies	14
Exostosis	1
Aural neuralgia	8
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	111

II. *The Middle-ear Cleft.*

Traumatic rupture of tympanic membrane	1
Eustachian obstruction :	
Right	39
Left	41
Bilateral	122
Acute non-suppurative otitis media :	
Right	25
Left	26
Bilateral	22
Chronic non-suppurative otitis media :	
Right	51
Left	55
Bilateral	193

Acute suppurative otitis media :	
Right	34
Left	39
Bilateral	11
Acute suppurative otitis media with mastoid com- plication	
	40
Chronic suppurative otitis media :	
Right	115
Left	79
Bilateral	96
Chronic suppurative otitis media with mastoid com- plication	
	62
Sequelæ of chronic suppurative otitis media :	
Right	42
Left	58
Bilateral	57
Intra-cranial complications of middle-ear suppura- tion :	
Meningitis	6
Sigmoid sinus thrombosis	3
Sinus thrombosis and cerebellar abscess	2
Sinus thrombosis and meningitis	1
Otosclerosis	25
Mixed middle- and inner-ear deafness	103
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	1348

III. *The Internal Ear.*

Internal ear affections :	
Congenital	8
Fracture of skull	4
Occupation	11
Labyrinthine suppuration	4
Post-suppurative	6
Cerebro-spinal meningitis	9
Post-scarlatina	1
Post-influenza	2
Mumps	2
Tubercle	1
Congenital syphilis	20
Ménière's symptom-complex	8
Anemia	1

Drugs	1
Senile deafness	3
Unknown causes	19
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	100

MISCELLANEOUS CASES (138).

(These include cases sent from other wards with negative findings, enlarged glands in neck, skin diseases, headache of obscure origin, mental defects, carious teeth, etc.)

TABLE OF OPERATIONS.

Operations on the Nose.

For rectifying fracture	1
Paraffin injection	3
Lupus (nose curetted)	4
Turbinectomy	12
Submucous resection of nasal septum	62
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	82

The Accessory Sinuses.

The maxillary sinus :	
Alveolar drainage	1
Nasal drainage	1
Radical operation	25
Dental cyst	2
Frontal sinus and ethmoidal cells (external radical operation)	9
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	38

The Pharynx.

Removal of adenoids and tonsils	756
Enucleation of tonsils	60
Fibroma of naso-pharynx	2
Retro-pharyngeal abscess	1
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	819

The Larynx, Trachea, and Oesophagus.

Tracheotomy	7
Thyrotomy	6
Plastic operation on larynx and trachea	1
Papilloma of larynx (direct method)	2
Extraction of tooth-plate from oesophagus (direct method)	1
	—
	17

The Ear.

Ossiclectomy	1
Schwartz operation	40
Modified radical operation (preservation of tympanic membrane and ossicles)	8
Complete radical mastoid operation	54
Operation on labyrinth	3
Operations for intra-cranial complications	11
	—
	117

Anæsthetics.

Ethyl chloride	784
Local anæsthesia	82
Chloroform	144
Ether	81
	—
	1091

ON THE USE OF THE WIRE SAW IN THE RADICAL OPERATION ON THE MIDDLE EAR.

BY V. SAXTORPH STEIN
(Kjøbenhavn).

IN a former article on mastoid operations under scopolamine-morphine narcosis¹ I mentioned *en passant* an easy method I had adopted to facilitate the most difficult part of the operation. I did not at that time lay much stress on the point, thinking that such a small matter was scarcely worth mentioning, but having been in the reports of the annual meeting of the French Oto-

¹ *Hospitals-Tidende*, No. 43, 1904.

Laryngological Society in May, 1910, that Dr. Delobel has recommended a chain saw for this operation, I think the time has come for me to relate the results of my experiences in this connection.

In order to lessen the danger of wounding the facial nerve Citelli and others have recommended the use of different instruments. Among others a probed chisel has been praised. This instrument I have tried, but it has not proved very successful in my hands. When the anatomical configuration is not sufficiently large the probed end of the chisel is likely to come into contact with the facial canal, and then when one is hammering on the chisel the facial nerve may be injured. For this reason I sought about for other means to overcome the difficulty. Seeing that the dangerous places lie deep to the aditus, it would seem to be most practical to make the incision through the bridge from within outwards, and it seemed that the wire saw was the instrument most suitable for this purpose. To this end I tried the ordinary Gigli saw upon the cadaver, but I had to reject it because the space was so small that I could not bend the rather stiff wire sufficiently to insert it round the bridge without running the risk of doing damage. The wire saw with which I was experimenting was 0.68 mm. thick, but it was the stiff eye which gave me most trouble. Having failed to obtain a wire saw sufficiently fine for the purpose I resolved to make one for myself. The difficulty was to provide a thin steel wire with a sharp-edged screw; consequently I made experiments to determine whether this sharp edge was a *conditio sine qua non*. By twisting two thin steel wires together I found that I was able in this way to produce the requisite "teeth," for when I tried a saw of this kind on a specimen the cutting power appeared to be quite sufficient. One cut of the saw, however, is not enough to remove the bridge, and when I tried to make a second cut at some little distance from the first I found that the wire had a tendency to glide into the first cut. Then I happened upon a remedy for this which seemed at first to be rather rash, but which a long experience has convinced me to be quite safe. I laid the point of a chisel against the bridge at a distance from the saw-cut and gave it a sharp tap with the hammer. The saw-cut gives the bone a certain amount of play, and in this way a fissure is produced by the chisel running right into the aditus, so that the whole piece of bone can be taken clean away. This manoeuvre shortens the operation, because at its most delicate point quite a large piece of bone can be completely removed. In a boy aged ten, for example, I was able so to remove a bridge measuring $4 \times 6 \times 8$ mm. It might be feared

that the chisel-cut would sometimes go in the direction of the Fallopian canal, but experience shows that it always passes towards the free edge of the aditus. At all events I have never seen facial paralysis in any case I had treated in this way.

This wire saw is so easily made that any operator can manufacture it for himself. Take a piece of piano wire (steel wire) measuring about 1 metre in length and 0.2 to 0.25 mm. in thickness; fold the two ends together, insert a hook into the looped end and twist the two lengths as tightly as possible without breaking the wire. It is best to make several for each operation in case the first saw introduced should break. After being used once they should be thrown away, because they get so twisted when they are in use that it would only be a waste of time to try them again. The cost and labour alike are trivial.

When the operation has progressed so far that the bridge is laid bare the moment has come to introduce the wire saw. This, as has been said, has a loop at one end, and this loop should be guided through the mastoid wound into the aditus and out through the external meatus. If the loop-end be bent at right angles, and if the bottom of the wound be well swabbed out, one can, when the space is not too narrow, draw it out by means of toothed forceps or a little hook. When the space is narrow it may be difficult to guide the saw out. In these circumstances the easiest plan is, first of all, to introduce an ordinary ligature into the aditus. It is a simple matter to draw the soft thread out with the slender bent forceps and to tie one end of it into the loop of the wire saw and to draw the latter through. In introducing the ligature the ordinary curved needle is, of course, of no use, but I have found a common darning-needle with the eye bent to a right angle quite successful. Once the saw is introduced, a sponge filled with water is wrung out over the wound in order to avoid the evolution of too great heat in manipulating the saw through what is, of course, the hardest bone in the body. Then take the two ends of the saw, twist them round the fingers, hold the saw against the lowest end of the bridge, and saw through. In exceptional cases, where the anvil accidentally gets fastened in the aditus, the wire saw cannot be inserted, and then the bone must be gonged away in the usual manner.

Having used this wire saw in many cases, and having seen how narrow the space often is, it seems to me that Delobel's chain saw is too clumsy, measuring, as it does, 3 by 2 mm., while the greatest diameter of my wire saw is only 0.4 to 0.5 mm., except at the

eye, which, unlike that of the Gigli saw, may be made as narrow as you like. A delicate instrument, such as a chain saw, is naturally much more expensive than my wire saw, and it cannot for this reason be thrown away after each operation. Moreover, it is difficult to clean the many small links. It seems to me, therefore, that the wire saw is a more practical instrument than the chain saw.

RETIREMENT OF DR. LEFFERTS.

At a meeting of the Council of the American Laryngological Association, held in New York City on January 14, 1911, a letter was read from Dr. George M. Lefferts, resigning his active fellowship in the Association, and announcing his retirement from medical practice. The resignation was accepted, and the following minute ordered incorporated in the *Proceedings* of the Council:

"Whereas Dr. George M. Lefferts has announced his withdrawal from medical practice, and has presented his letter of resignation from active Fellowship in this Association:

"Resolved that this resignation is accepted with the deepest regret. Dr. Lefferts was one of the Founders of this Association, being present at the inaugural meeting in Buffalo, June 3, 1878. He was chosen Clerk of the meeting, and was elected the first Secretary and Treasurer of the Association then and there organized. He held this office for three years. He was then elected President, serving one year.

"To his high standing as a scientific physician, his zeal in promoting the interests of the new organisation, his fidelity to the duties of his respective offices, and his judgment in formulating plans for the proper conduct of the Association, it owes mores for its continued success than it can fitly acknowledge.

"To him this Council extends its congratulations on the cessation of his career as a laryngologist, and into his well-earned retirement its best wishes follow him."

It was resolved that this minute should be entered in full on the records of the Council, and a copy of it be sent to Dr. Lefferts and published in the special journals.

INJURIES OF THE HEAD AND NASAL DISEASES.

BY C. ZIEM,
of Dantzig.

OBSERVATIONS of injury of the head nowadays not being considered complete if examination of the ears be omitted, it is astonishing that in such cases so little stress is still laid upon the state of the nose and the sinuses. A. Poppi is right in saying "*Pesame obbiettivo della cavita nasali, oltre che nei casi di traumi diretti, non sara mai da trascurarsi in ogni caso di traumi gravi al capo, per la frequenza con cui si puo determinare per essi la frattura della base del cranio e quindi anche possibili lesioni dell'etmoide*" (1). I am glad of being able to communicate three observations of this kind, pretty important as it seems.

CASE I.—A—, aged twenty-six, ex-sergeant of artillery, was, October 4, 1906, thrown out of the saddle by a skittish horse, and falling down, hurt in the right inferior or parietal region; unconsciousness for about ten minutes; abundant hæmorrhage from the right ear, nostrils, and mouth. Was attended to during four months in several hospitals. His nose, always obstructed, was once examined, but, fortunately, no galvano-caustic treatment. Incapable of resuming his duties owing to vertigo when stooping; headache, tinnitus, etc. May 1, 1907, discharged; kept at home till early in August. Then occupied in several employments, as jailer, type-writer, etc., in the office of the State, but never could long fulfil his functions owing to vertigo, headache, great irritability not formerly present, trembling of the right arm, and even of the whole body, owing to emotions or prolonged efforts. Moreover, confused and fearful dreams.

First attendance October 2, 1908. Nearly hopeless, scarcely expecting his health to be re-established; he complains of obstruction and suppuration of his nose. Swelling of the nasal mucosa, anosmia, supra-orbital neuralgia on the right; tenderness of right inferior parietal region. Treatment: Nasal, retro-nasal, frontal, and ethmoidal douches of salt water by means of the continuous force-pump and appropriate nozzles; leeches to root of nose; substantial nourishment, especially by means of malt; at night, honey or cherry-juice, facilitating rest. November 19, 1908, after fourteen consultations, he kept away, having no further complaint, and I saw him again only thirteen months later, December 20, 1909, for simple angina, which was quickly cured.

April 17, 1910.—Headaches, vertigo, agitation, trembling of hands and body no longer present, not even after prolonged efforts, so that he is not inferior to any of his fellow typers. Sleep quiet; confused dreams very seldom; nose always free; no suppuration; no anosmia. Watch, left 50 cm.; right in contact; drums, right more opaque than the left one, nothing else remarkable. Vision, left = $\frac{4}{3}$, amplitude of accommodation = 5.5 dioptries, that is, 2.5 dioptries short for the patient's age; vision right with + 1.0 = $\frac{4}{2\frac{1}{4}}$. Jaeger 3 slowly. Right pupil somewhat dilated and slowly contracting. Movements of the eyeball normal; no diplopia, not even with red and green glasses; no detachment of retina nor other abnormality. Arms maintained in horizontal direction three minutes. This limit, he states, was never exceeded. Certain degree of impotence, attributable probably to weakening of his body by the accident. He complains, for the rest, only of diminution of his seeing and hearing power on the right side.

July 17.—The Surgeon-General, much surprised by the amelioration obtained, has reduced his accident pay from $33\frac{1}{3}$ to 20 per cent., and would have reduced it further but for the probably lasting diminution of sight and hearing. Some tenderness on pressing the injured portion of the head still exists; memory not yet re-established, and miscalculation not always out of question. He walks backward with eyes shut, well.

CASE 2.—Gr——, aged twenty-nine, ex-cuirassier, wounded in the German Campaign in South Africa at the beginning of 1906 by a shot grazing the breast and another through the thigh, and falling from his galloping horse, struck with his forehead, especially the right upper frontal region, the root of a tree. Unconsciousness for about a quarter of an hour. Hemorrhage from the right nostril, recurring in hospital during more than nine weeks; but nose was never examined, even in spite also of shortness of breath. Giddiness, sleeplessness, aggravated by quinine. Slowness of speech, at times very striking, but never unintelligible. At the end of June service resumed, but owing to headaches after riding and prolonged efforts, and vertigo, discharged in the beginning of 1907. Afterwards employed as assistant in a goods office, as jailer, and typer at the Imperial Wharves of Dantzig. Owing to temporary mental dulness after long working and intellectual fatigue again took quinine, but without benefit. Never heavy drinker.

First attendance November 13, 1909, for trouble of vision of

his left eye, removed by 1.0 cyl. Returned December 19 for headache, vertigo, great irritability, trouble of speech, restless sleep, fearful dreams, obstruction and suppuration of the right side of the nose; three to four pocket handkerchiefs daily. Only swelling of the nasal mucosa on the right. Nasal, retro-nasal, frontal, and ethmoidal douches with great relief to the head; also retro-antral blistering, cherry-juice, honey, malt, Quaker oats, etc. After eleven consultations from December 19, 1909, to March 16, 1910, much better, but suddenly, April 2, after a violent excitement, attempted suicide; the shot grazed his breast harmlessly.

April 16.—Drum, right and left, normal; watch, right, 60 cm.; left, 70 cm.

Vision, right, Jaeger 2 from 38-9 cm.; amplitude of accommodation = 8.25 dioptries. Left, Jaeger 2 from 29-9 cm.; amplitude of accommodation = 7.5 dioptries. Staggering when arms extended horizontally or raised vertically after 1.45 and 2 min. respectively; formerly could hold them so for 5 min.

Nose seldom obstructed, only one handkerchief every two days; sense of smelling better. Sleep much better. He counts in one minute to 106, a year ago only to 86.

July 7.—Vision: right emmetropic, $\frac{1}{4}$; left, + .75 cyl. $\frac{1}{4}$; no longer spectacles when working. Right pupil a little slower in contracting than the left. For the rest so great an amelioration that his accident allowance has been reduced from 33 $\frac{1}{3}$ to 20 per cent. by the Surgeon-General. Sleep perfectly quiet; no dreams. Nose always free, fresh handkerchief every three days. No more vertigo, only after 10 Kotan, one quickly after another, some pressure in the front, just as in very bright sunlight. Arms horizontally 5 min.; vertically 7 min. No longer so great irritability. Appetite good; less thirst.

July 16.—No more tenderness when pressing the injured part of the head. In saying the alphabet he leaves out some characters, but when admonished he does not remember forthwith or at all those that have been omitted. He is, according to his comrade's statement, clever at sums. When numbering, many involuntary (reflex) contractions of muscles of the face. Has always been right-handed. No longer giddiness, but he walks backwards with eyes shut somewhat awkwardly.

CASE 3.—K—, aged twenty, rivetter. First attendance May 27 for vertigo, after having hurt his forehead on the right side near the edge of the hairy scalp by falling from a height of

20 metres upon a jack. Unconscious for about an hour; hæmorrhage from both nostrils and month, not from the ears. Wound dressed by means of iodoform gauze, not sewn; nose not examined. Much thirst, raspberry juice given. Since that time mental dulness; at night heavy, fearful dreams. After six weeks returned to work, but again three weeks at home for vertigo, especially when stooping, even for a short time. Never bleeding of the nose before the accident. Ex-leader of a gymnastic club, prize-man two years ago. Nasal, retro-nasal, frontal and ethmoidal douches with salt water, by means of my force-pump; retro-auricular blistering: raspberry-juice, cherry-juice, honey, malt, Quaker oats.

June 8.—Sleep much quieter; almost no dreams, but still giddiness on stooping. Nose more free. Still tenderness when pressing the region of the trauma. Much thirst; appetite not satisfactory. Vision to the right = $\frac{4}{18}$, with glasses not better; to the left = $\frac{4}{6}$, with + 1.0 = $\frac{4}{3}$; left pupil, well; right contracts somewhat slowly. Ophthalmoscope, no anomaly; no double vision.

June 22.—Vision, left, = $\frac{4}{3}$, somewhat better with + 1.25; Jaeger 2 from 48—13 cm.; accommodation = 5.5 dioptries. Right, = $\frac{4}{18}$, with + 1.0 = $\frac{4}{3}$; Jaeger 2 from 46—15 cm.; accommodation = 4.25 dioptries. No disturbance of speech. Sleeps very well. Watch, right and left, 30 cm.; drums normal.

Arms horizontally, 40 sec.; vertically, 20 sec.; formerly much longer. Often trembling of the right, and only the right arm. After 2 Kotan giddiness visible. Moved the tip of the foot in a circle formerly very well, now awkwardly. Stands with eyes shut and feet together (Romberg) pretty well. Still debility. Less sexual desire than formerly. Memory before the accident very good, now short. He numbers in one minute for the first time to 67, for the second time, a little later, only to 56, as tired. Hand-writing without anomaly.

July 15.—Still tenderness on tapping the right frontal bone. Arms horizontally, 70 sec.; vertically, 90 sec. Romberg well, likewise circling of the foot. He walks backwards with eyes shut well. He numbers in one minute to 87, reads more fluently and with more understanding. Nose always free. He is in high spirits, but his memory not yet as good as before the accident. After some weeks of incapacity he returned to work July 18.

I shall delay, in the meantime, the relation of some other cases of trauma of the head complicated with affections of the nose or sinuses. In all three cases reported there was a lesion of the right

side of the head, but only in the second was the speech affected in consequence, and that although this patient was right-handed, as were the two others, and although in troubles of speech from lesions of the right frontal region one has had repeatedly to do with left-handed persons. But in this case there was, perhaps, contra-lateral involvement of the *left* frontal lobe, owing to asymmetric development of both the frontal sinuses with enlargement of the right and diminution of the left sinus, just as has been excellently shown by Prof. Onodi in some of his plates (2); examination by X rays in my case would have, perhaps, cleared up the matter.

Involvement of the middle ear, by a more extensive fracture of the base of the skull, was present only in the first case.

Diminution of vision of the contra-lateral eye in the second case, balanced by a cylindric glass, has scarcely any relation to the lesion of the head. But in the first and third cases involvement of the right eye has really happened, if not by fracture of the optic canal, then certainly by some tearing (pulling) of the optic nerve and the ciliary ganglion, too, situated laterally to the nerve. The great amelioration of the vision, to the right, in so short a time would, indeed, be somewhat surprising, but for many analogous favourable results, by re-establishment of normal circulation within the eye, as described by me years ago; also in the first case the result, as to the damaged eye, would have been, perhaps, better if the patient had come earlier under my observation.

Hæmorrhage from the mouth and nose and hemilateral anosmia in all three cases are to be interpreted, naturally, by fracture of the ethmoid.

As to heavy, fearful dreams present in all three cases, and outlasting the injury itself by a long time, I might attribute them to a (secondary) inflammation of the frontal sinus, since I have not seldom observed such dreams in influenza with frontal sinusitis. The current tendency to refer dreams, without further examination to indigestion is a narrow and often quite erroneous one; *e. g.* a patient severely hurt in the forehead and with delusions has lately had the stomach pumped out, although the frontal sinus, then successfully treated by me, was the seat of the disease and the cause of the dreams. Moreover, what relation can be established between a presumptive indigestion in one of Augustus Octavianus's friends and this friend's dream saving Augustus from danger of life on the night previous to the battle of Philippi (Sueton, 91)? What connection between the appearance of fearful dreams and an overloaded stomach to Nero, formerly dreamless, after having

murdered his mother (Sueton, 46)? It seems almost as if the utilisation of dreams in diagnosis insisted upon by Aristotle, Galen, Tertullian and others (3) would soon bring on a veritable inundation of dreams (4), so that it might be advisable to remember a saying of Epictetus: "Though thou thyself mayest take a pleasure in telling thy dream, another will take no pleasure in hearing it"? (5). For the most part it will be sufficient to ascertain if dreams be not caused by a feverish state, a suppuration of the nose or the sinuses by unhealthy dwellings or the like.

As to vertigo, it is impossible that it depends, according to the current opinion, in the second and third cases, on an affection of the middle or inner ear when such does not exist; moreover, in the first case with involvement of the ear, by fracture of the base of the skull, vertigo has perfectly disappeared in spite of continuance of the ear affection. In former publications of mine it has been demonstrated, by several observations, that troubles of equilibrium without involvement of the ear are not rare in affections of the nose and the sinuses, especially the frontal sinus, and are explainable by secondary troubles of the circulation in the anterior part of the brain (5a); analogous observations have been published both in the Dutch *Rhino.-Laryng.-Otol. Soc.* (6) and by Professor Francke of Brunswick (7).

With regard to memory, Pliny observes " . . . nihil aliud est æque fragile in homine . . . ietas lapide oblitus est literas tantum; ex præalto tecto lapsus matris et affinium propinquorum cepit oblivionem . . . " vii, 24. Such troubles have in all three cases been observed, but as yet only partly compensated, and cannot, perhaps, be perfectly compensated, even after re-establishment of normal circulation in the forehead, although I have not seldom observed a great improvement in the memory by treatment of nasal diseases. Honey is said to have been employed even by the ancient Jews to strengthen the memory (8), but in my cases it was given—as well as raspberry- and cherry-juice—as a sedative and to facilitate the night's rest; on the other hand, with several of my patients suffering from suppuration of the nose or frontal sinus, diminution of dreams has been obtained without honey or cherry-juice by simple douches of salt water, "rocking the brain and steeping the senses in forgetfulness."

Change of character follows not infrequently lesions of the head. In a case of traumatic moral insanity observed by Professor Kroenlein, of Zurich, anatomical examination showed destruction of the gyri frontal. rect. right and left and, partly, of the gyr.

front. inf. e. med. right (9). So great an alteration is, in view of the quick recovery or amelioration, certainly not to be expected in my first and second cases, whilst in the third case no psychical modification, apart from some want of memory, exists. The question is, therefore, whether the great irritability in the first and second cases is not to be explained by temporary congestion of the plexus choroid sup. (ant.) of the brain owing to traumatic vasomotor paresis; for these plexuses are, doubtless, of much more consequence than we were, on account of inadequate anatomical investigations, hitherto inclined to suppose. These plexuses have nearly always been drawn in a shrivelled and bloodless condition, but really extend, as shown in a classical section of the frozen head by W. Branné (10), much more forward; in the injected preparations of E. Zuckerkandl they also are drawn much thicker than usual (11).

As to treatment, galvano-cauterisations of the swollen nasal mucous membrane would have done in my cases probably much harm by driving the blood back to the forepart of the brain and so increasing the nervous troubles, as I have shown in an analogous case twenty-five years ago (12). The success here obtained is, it seems, attributable to stimulation of the venous and, according to R. Falcione's anatomical researches, the lymphatic circulation in the forepart of the brain owing to douching of the nose and its superior parts with salt water. It is, perhaps, to be hoped that also in earlier stages of lesions of the head and fractures of the base of the skull such douches carried out with due care will give better results than some authors would, *à priori*, suppose. At all events it should be laid down as a rule that neurologists should, more than hitherto, attend to troubles of the nose and sinuses, owing to their close relations with the brain, as is excellently shown in frontal sections of the head by Zuckerkandl, Onodi, and Bardeleben-Frohse (13).

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- (3) Cf. VOLKMAR.—*Psychologie*, i, 1894.
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- (5) *The Spectator*, October 31, 1712.
- (5A) *Med. Klinik.*, 1909, No. 3.
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- (8) Cf. VOLKMAR.—*Loc. cit.*, p. 197.
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SOCIETIES' PROCEEDINGS.

PROCEEDINGS OF THE ROYAL SOCIETY OF MEDICINE—LARYNGOLOGICAL SECTION.

Meeting on Friday, February 3, 1911.

DR. P. WATSON WILLIAMS, *President, in the Chair.*

Abstract report.

The following cases, specimens, etc., were shown :

DEMONSTRATION ON THE LIVING SUBJECT OF THE HILL-HERSCHELL COMBINED DIRECT AND INDIRECT METHOD OF ESOPHAGO-GASTRO- SCOPY.

BY DR. WILLIAM HILL.

The direct stomach-tube provided with an inflating apparatus was passed, under cocaine, into the stomach, and the cardiac end examined by the direct method. Then a periscope was passed through the tube into the stomach and the pyloric region demonstrated to the members of the Section.

The PRESIDENT congratulated Drs. Hill and Herschell upon the ease with which the tube had been passed upon the patient, especially as the latter had not been prepared for such an operation. The speaker had been gratified at the excellent view he had obtained of the pyloric region.

Mr. TILLEY asked in what position Dr. Hill placed his patients when examining them under a general anaesthetic. The speaker had found the left lateral position much more convenient than the old dorsal position, both for laryngeal and for tracheal cases, and he wondered whether the same held good in using the long stomach-tube.

Dr. STCLAIR THOMSON asked if Dr. Hill had had any opportunity of using his method for diagnostic purposes.

Dr. E. A. PETERS asked how the stomach was washed out prior to the examination.

The PRESIDENT said that from his own experience he could confirm Dr. Tilley in preferring the left lateral position when using the direct method.

Dr. HILL replied that he had tried Mosher's position, and had found it useful in many, but not in all cases. In most cases he entered the mouth towards the right side and so reached the middle line of the

cesophagus, altering the position of the patient and the tube according to circumstances when once the stomach had been reached. In gastroscopy the patient's position was not of very great importance; he might either be lying down or sitting up. In examining the upper parts of the passages Mosher's position was very good. With regard to diagnosis, he had so far had no opportunity of using his method; at present he was learning the normal appearances. He had used it, however, in several cases of disease at the cardiac end, but in these cases it possessed no very great advantages over the ordinary direct method. The Hill-Herschell method of gastroscopy was the safe method of viewing the interior of the stomach. He did not recommend it in acute ulcer or in cases of hemorrhage, but in the differentiation of chronic ulcer from cancer he thought it would prove of value, and during operations on the stomach the instrument could be used to guide the surgeon to the exact seat of the lesion.

Dr. HERSCHELL, in reply to the question as to the washing out of the stomach, said that the best plan was not to wash out the stomach at all, but to examine the patient after he had been fasting for some hours. The essence of this method was that the gastroscope was not passed into the stomach blindly. The gastroscope was passed through the direct tube, and the stomach contents could be aspirated and the viscus washed out under inspection. The aspirator he employed was a French instrument, which had the merit of aspirating the fluid in a large stream.

CASE OF TUBERCULOUS TONSILLITIS (WITH MICROSCOPIC SPECIMENS).

BY DR. FRANK ROSE.

Male, aged twenty-one, noticed some swelling in the neck and slight soreness of the throat at the end of November, 1910. Both tonsils enlarged and granular. Upper group of cervical lymph-glands enlarged. Von Pirquet reaction negative. Chest said to be healthy. Section of piece of tonsil removed for examination, and section stained for tubercle bacilli. Arytænoid œdema had recently appeared, and tubercle bacilli had been found in the sputum.

Mr. SECCOMBE HETT said that some time ago Dr. Wylie had shown a case of tuberculosis of the tonsil in which there were signs in the chest, and in the discussion Dr. StClair Thomson had remarked that he had not before seen a case in a patient well enough to go about. Since then the speaker had seen several similar cases, all with obvious and not merely microscopic evidence of tuberculosis of the tonsils. One of these went about for six months with a normal temperature; the tonsillar ulcers extended, however, and he enucleated the tonsils.

Dr. JOBSON HORNE observed that this case raised the question as to how far the tuberculosis of the tonsil was primary. The only form he himself had hitherto seen had been cases in which the disease lay in the body of the tonsil without any external evidence of tuberculosis. In those cases there was enlargement of the cervical glands and an absence of lung trouble.

Dr. DAN MCKENZIE said that Dr. Jobson's Horne's and Mr. Hett's

remarks, together with the evidence derived from cases like that now shown, proved that there were two types of tuberculosis of the tonsils: One in which the disease occurred within the tonsil, caused no ulceration, and was evident only on microscopic examination. This form occurred mostly in children. It was associated with tuberculosis of the cervical glands and the lungs were not affected. In the other type the disease appeared in the form of ulceration of the surface of the tonsil, obvious on inspecting the throat. This form occurred mostly in adults. It was not accompanied by tuberculosis of the cervical glands, but it was associated with disease in the lungs.

BILATERAL TUBERCULOUS DISEASE OF TONSILS WITH TUBERCULOUS LARYNGITIS.

BY MR. CECIL GRAHAM.

Female, aged twenty-nine. Pain in swallowing and enlarged glands in left side of neck for eight years. Pain in swallowing, hoarseness, and tenderness of glands more noticeable for two months. Both tonsils were large and ragged, the left being covered by whitish-yellow secretion. There was infiltration of fauces on either side, which was spreading to middle line, involving the uvula. There was cedema of left arytaenoid. Sir John Broadbent had examined the chest, and had found no evidence of advanced disease of the lungs. The inference was that the case was one of primary disease of the tonsil.

Dr. BRONNER asked whether primary superficial tuberculosis of the tonsil was common or not. In his own experience the tonsillar disease generally occurred in phthisis.

Mr. SECCOMBE HETT said that he had also seen cases like the present. With reference to what Dr. Dan McKenzie had said with regard to the two types of tonsillar tuberculosis he would add a third type, namely, that of miliary tuberculosis of the tonsil.

Dr. E. A. PETERS reminded the section of Dr. Walsham's investigations upon tuberculosis of the tonsil. According to that observer the ulcerative form was rare.

Dr. L. H. PEGLER held that there were more cases of primary tuberculosis of the tonsils, apart from lung disease, than was generally supposed.

The PRESIDENT said that it was difficult to decide whether tonsillar tuberculosis of the ulcerative type was ever primary or whether it was always associated with disease in the lungs.

Dr. ROSE, in reply, said that his case belonged probably to that group where the infection came from the lungs. He called attention to the negative skin-reaction as a misleading circumstance. It was important to decide whether the disease in the tonsils was primary or not, because if it were primary the tonsils should be operated on.

Mr. C. GRAHAM thought that his case was one of primary tuberculosis of the tonsils, because during the eight months during which the patient had been under treatment no signs in the lungs had appeared. For that reason he proposed to operate on the tonsils.

A CASE OF TONSILLAR DISEASE OF DOUBTFUL DIAGNOSIS.

BY MR. SOMERVILLE HASTINGS.

MR. BETHAM ROBINSON had no doubt that this was a case of carcinoma; there was an enlarged gland in the neck.

Dr. JOHNSON HORNE thought at first sight that there was an element of syphilis in the case.

Dr. KELSON said that the disease had the exceedingly white appearance seen sometimes in cancer of the larynx.

MR. SOMERVILLE HASTINGS, in reply, said that there were some points against the disease being malignant. He had had two pieces removed and microscoped; the first was suggestive of cancer, but not the second. Moreover, there was an absence of induration in the ulcer, and it had persisted unchanged for twelve weeks. However, he was resolved to excise it freely, and would show the case again.

PLASTER CASTS OF UNUSUAL MALFORMATION OF UPPER JAW.

BY MR. HERBERT TILLEY.

From a man, aged thirty-two, who was brought for "congenital cleft palate, constant cough, inability to breathe through the nose, swallowing the tongue at night, and excessive expectoration of mucus in the morning." Examination showed that the roof of the hard palate was intact and V-shaped, the narrow end of the V forming the roof of a deep median cleft, the sides of which consisted of the hypertrophied alveolar borders of the upper jaw. The width of the median cleft between the alveoli was less than $\frac{1}{2}$ in., and the breadth of the right alveolus was $\frac{3}{4}$ in. The lower molar teeth pointed inwards against the side of the tongue, and the lower incisors projected beyond the upper ones. There was well-marked alar collapse and much septal irregularity.

Dr. DONELAN said that the malformation affected the alveolar border rather than the jaw as a whole. Dental experience seemed to show that this thickening of the alveolar processes was due to long-standing pyorrhœa alveolaris.

MR. H. TILLEY said that the patient, a man, aged twenty-two, was a sufferer from severe pyorrhœa, and the deformity might have been due to septic absorption. The whole face, however, was badly developed, and the alæ and nose very narrow, although the patient was an intelligent man. The condition of the jaw looked worse in nature than in the cast. He did not propose to operate on the nasal septum, because this, he was sure, would not benefit the patient.

CASE OF TUBERCULOSIS OF THE VOCAL CORDS IN A YOUNG MAN,
WITH MICROSCOPIC SLIDES AND SPECIMENS.

BY DR. PEGLER.

Patient, aged twenty-one, sorter in a fur-dyer's warehouse.

came to the hospital in April, 1910, complaining of loss of voice, a harsh whisper having gradually replaced phonation. Examination showed the cords, when cleansed of secretion, to be much ulcerated, the right one also showing a characteristic longitudinal splitting. They approximated very imperfectly, though the vocal bands approached a good deal on attempted phonation. There had been very little alteration since. There was a ridged deflection of the septum to the left, which was corrected submucously, and an adenoid mass was noted, though not removed at that time. Last November much more secretion was seen to be dropping down upon the glottis, and then it was found that the adenoid mass was much ulcerated. At this period the secretion was examined for tubercle bacilli and the chest again stethoscopically, both with negative result. The adenoid mass was curetted, and sections (of which one was shown under the microscope) displayed many giant-cells in the ulcerated part, but no tubercle bacilli could be found. The naso-pharynx healed slowly, and from the granulating surface a piece of tissue was submitted to Dr. Hillier, of Middlesex Hospital, who inoculated two guinea-pigs with it, while Mr. Hastings applied von Pirquet's test. The latter gave no result, but the guinea-pigs became infected with tubercle. He showed a preparation of one of them in which the lungs, spleen, and various glands were invaded with tubercle; scrapings from the glands of both animals showed tubercle bacilli. This settled the diagnosis if any doubt existed, but the lad, who was now installed as clerk under the same firm, had no constitutional symptoms, and declared that he never felt better in his life.

Did this curious case give any grounds for the belief that the laryngeal disease was due to inhaling dust from the skins among which the patient worked? When he first came the adenoid mass was healthy, and the question arose whether it had become infected from below. He asked for suggestions as to the treatment of the vocal cords.

Dr. JOSEPH HORNE had seen similar ulcers on the cords of cigar-makers working in the process known in the trade as "biting-out." He had inoculated guinea-pigs with the tobacco and the animals died from tuberculosis, as he had found tubercle bacilli in them. But he had refrained from publishing the results as he was not quite sure that the animals' death was actually due to infection from the tobacco. At a subsequent date he found another worker similarly infected. He found no disease in the lungs, and none developed later. The larynx healed up afterwards. The present case he did not regard as one of primary laryngeal tuberculosis.

The PRESIDENT thought that benefit might be obtained from "B.E. tuberculin," the dose being increased until definite reactions appeared.

MALIGNANT DISEASE OF THE LARYNX.

BY DR. PEGLER.

H. G——, male, aged forty-two, had complained of hoarseness on and off for a year, worse the last three months. No pain, no difficulty in swallowing; thought he was losing weight; denied syphilis. Examination showed a large excavated ulcer involving the base of the left ventricular band, vocal cord, and arytenoid region; small punched-out ulcer with regular border on right ventricular band at a spot one third of its length from the anterior commissure; fixation of left side of the larynx. No enlarged glands in the neck. Had taken iodide of potassium for three weeks without any benefit.

The PRESIDENT raised the question of the disease in the larynx being tuberculosis.

Dr. JOBSON HORNE looked upon it as malignant and not tuberculous.

EXTENSIVE ULCERATION OF PHARYNX AND TONSILS.

BY DR. PEGLER.

G. W——, male, aged fifty-eight, had complained of pain in the right side of the throat and in the right ear (worse on swallowing) for three months. He was losing weight. Examination showed extensive ulceration involving the right tonsil, anterior pillar of the fauces, and posterior part of the soft palate extending to the middle line and also encroaching upon the base and right side of the tongue. There was a deeply excavated ulcer in the region of the supra-tonsillar fossa. The edge of the growth was raised, hard to the touch, and nodular. Some deficiency in movement of right half of soft palate; slight dextral deviation of tongue on protrusion. No enlarged glands in the neck. Patient had been taking 45 gr. of the iodide *per diem* since December 15, 1910.

Mr. BETHAM ROBINSON and the PRESIDENT had no doubt of the ulceration being carcinomatous.

Dr. PEGLER, referring to his first case, said that he regarded the laryngeal disease as primary. The third case he looked upon as syphilitic, although the results of treatment had not been appreciable.

PRIMARY CARCINOMA OF TONSIL.

BY DR. E. A. PETERS.

S. A. H——, aged thirty-eight, private patient, came for

enlarged glands and slight sore throat in November, 1910. In 1907, at the advice of a surgeon, an abscess in the jugular region had been opened, but the glands had steadily enlarged since, and in November, 1910, were felt as a nodular hard mass in the region of the deep cervical glands usually enlarged in tonsillar affections, and extending upwards, so that palpation of the tonsil revealed this organ as a thin layer, covering, apparently, a hard gland. The tonsil itself measured about $1\frac{1}{4}$ in. across, was dark red, with slightly indefinite margin, with absence of crypts; there was no ulcerated surface.

The tonsil was dissected out on November 24. It was more friable than usual, but the capsule was definite, and only on microscopical examination were the squamous cells apparent. The microscopical section showed that practically the whole tonsil was affected, though there was no ulceration. The deep cervical and submaxillary glands, with typical degenerative cysts, were removed on December 13, and also the mass on the outer side of the superior constrictor. This mass had extended up to the base of the skull and round the vessels.

Dr. Ellis, who had had charge of the patient, had now placed him under X-ray treatment. It was suggested that the growth of the tonsil was primary, though not obvious to the naked eye, and that these may be the usual clinical features in such cases of glands of the neck where the primary source was not apparent.

Microscopical section showed typical squamous carcinoma.

The PRESIDENT remarked that the case was an interesting one. The question was how had the glands become affected?

Dr. PETERS regarded the case as an example of an important class. A large number of cases of malignant glands in the neck he had found to be due to malignant disease of the tonsil. There was no ulceration; the tonsil was larger and harder to palpation than usual. The capsule was definite and clear of disease, and there was no sign of disease in the tonsil save to microscopical examination which showed the growth under the mucous membrane.

SWELLING AT JUNCTION OF RIGHT VOCAL CORD AND UPPER APEX OF VOCAL PROCESS.

By DR. DONELAN.

Man, aged fifty-two, professional singer, had influenza during first weeks of November, 1910. Seen on December 8. Had hoarseness, marked hyperemia of right vocal cord and vocal process. This subsided under rest and sedative inhalations, and the hyper-

emia had disappeared save for a slight areola surrounding a clear herpetic-looking vesicle on the apex of the vocal process. This ruptured, leaving a circular divided surface, which in a few days covered over with epithelium. On December 22 there appeared to be more of this epithelium than one would expect in a normal process of cicatrization. Patient continued silent until January 11, 1911, when, as the surface appeared healed over and very healthy, he was allowed to speak and to take part in some quartettes, singing very little, and only for a few minutes on three or four occasions. On January 25, when he was next seen, hyperemia of the right vocal cord had returned, and the epithelium, at the point referred to, had rapidly increased, assuming the size and shape of half a lentil. Patient complained of pain on swallowing in the right side of neck at the cricoid level. On this date, when these notes were sent in, there was no apparent impairment of mobility in the vocal cord.

The PRESIDENT thought the condition inflammatory, but advised that the case should be closely watched because of possible malignancy at a later date.

Dr. FITZGERALD POWELL agreed with the President. He recommended rest and the application of zinc chloride to the larynx. The nose also required attention.

PAPILLOMA OF LARYNX IN A CHILD.

BY DR. DAN MCKENZIE.

A little girl, aged eight, came to hospital six months ago with hoarseness and stridor. Inspection of the larynx gave a glimpse of a rough growth, the exact seat of which was uncertain. The obstruction to breathing being very great, tracheotomy had to be performed before the growths in the larynx were attacked. After tracheotomy several papillomata were removed by the direct method. On one or two subsequent occasions other small portions were removed, chiefly from the subglottic region in front. Dr. Wyatt Wingrave reported the growths to be papillomata. Several of the growths were exhibited, including one fairly large in size, the first to be removed.

Dr. A. BRONNER had found a spray of $\frac{1}{4}$ to 1 per cent. formalin, or the direct application of 1-5 per cent. solution, useful in papillomata in adults. After using the spray recurrence took place only in the lower parts of the larynx, and after applying it directly to these parts recurrence ceased entirely.

Dr. DAN MCKENZIE had experienced in operating on this case the advantages of placing the patient in the lateral position. He had also

found a large tube surprisingly easy to insert and much more convenient to operate through than the usual small child's size.

LINGUAL THYROID.

By DR. GEORGE W. BADGEROW.

Female, aged seventeen. Patient came to the Throat Hospital complaining of hoarseness and thickness in speech which had been gradually coming on in the last two years; adenoids removed recently with some improvement in speech. The vocal cords were seen with difficulty owing to overhanging epiglottis. Hemispherical swelling over the base of the tongue which was hard to the feel.

Mr. STUART-LOW had some time ago exhibited a case similar to this save that the tumour was larger. The diagnosis in these tumours lay between dermoids, thyroid tumours or thyro-glossal cysts. The present case he looked upon as a thyroid tumour. As the thyroid could be felt in the neck, though situated rather low down, removal of the lingual tumour was feasible. He had operated in his case by splitting the tongue, after laryngotomy had been performed. This method, which he believed to be new, had proved very useful; the access was good and there was very little hæmorrhage.

Mr. FITZGERALD POWELL said that he agreed with Dr. Badgerow that the tumour in this case should not be operated on unless it got larger. It caused the patient no inconvenience and had been discovered accidentally. Only when the tumour was large, as in Mr. Stuart Low's case, should it be removed.

Mr. BETHAM ROBINSON had found very little evidence of the presence of a thyroid gland in the neck. The tumour in the tongue was very hard, especially on the left side, and there was also a hard lymphatic gland in the neck. Consequently he was inclined to suggest that it might be a lymphoma.

Dr. BADGEROW, in reply, said that several other observers had been unable to discover any thyroid gland in the neck.

RECURRING APHONIA IN A WOMAN, AGED THIRTY-SIX.

By DR. CATHCART.

Loss of voice first came on in 1905 after a severe attack of influenza. Patient was treated at a hospital, and after two months, being no better, went to the country, where she stayed three months. From there she went into Mount Vernon Hospital, and, after being kept in bed for six weeks, the voice came back with several applications of the inter-laryngeal electrode. She was kept in the hospital for six weeks longer, undergoing the open-air cure. The voice had been lost three or four times since, but each time it

had been brought back with electricity. Last year the patient was confined to her bed three times with attacks of rheumatism. The aphonia came on last September and had continued ever since. The case was an interesting one, as apparently from her treatment in Mount Vernon she must have been considered at one time tubercular. She complained of great pain in the throat and constant cough, but there was no sweating or loss of weight, and von Pirquet's test was negative. On laryngological examination it could be seen that the mucous membrane was swollen over the arytenoid and in the inter-arytenoid space, and the cords did not meet properly. The throat had been treated locally and the anti-rheumatic remedies had been pushed, but the aphonia, pain, and cough still continued.

Dr. PEGLER said that some cases of functional aphonia went on for years, while others got well after local treatment of the mildest kind.

Dr. JOHNSON HORNE, from the facts narrated, looked upon the case as one of tuberculosis, like many others of the same kind.

The PRESIDENT said that in many cases of functional aphonia one should be careful not to overlook incipient tuberculosis.

CASE OF MALIGNANT STRICTURE OF THE OESOPHAGUS.

BY DR. WATSON WILLIAMS.

A. P—, male, aged sixty-four, had noticed increasing difficulty in swallowing for three or four months, but much more markedly during the previous six weeks, with consequent loss of flesh. Was unable to swallow even fluid food when seen on January 10.

Subsequently œsophagoscopy revealed an infiltrating growth ten and a half inches from the incisor teeth. Bronchoscopy.

Dr. HILL, who had examined the growth by the direct method, said that he would advise examination of the case under a general anæsthetic in order that the stricture might be dilated and the lower limits of the growth defined. It might be too far advanced for radium to do much good, but he was willing to try it. The longest application of radium he had hitherto made to œsophageal cancer was twenty-eight hours.

The PRESIDENT replied that the case had already been examined under a general anæsthetic and a No. 8 œsophageal bougie was passed, though it was tightly caught.

EPITHELIOMA OF THE EPIGLOTTIS.

BY MR. NORMAN PATTERSON.

The patient, a man, aged forty, had noticed pain on swallowing solids for the last two months, and during the last month pain just

after the swallowing of saliva and other fluids. The pain shot from the region of the tip of the great cornu of the hyoid on the left side towards the back of the ear. There was a tendency to the accumulation of saliva in the throat. The condition was seen to affect the anterior and to a less extent the posterior surface of the left portion of the epiglottis. It was just spreading on to the back of the tongue and corresponding ary-epiglottic fold. The lower portion of the larynx appeared to be healthy. There were some palpable glands in the neck, especially on the left side, which were probably to be accounted for by the septic condition of the teeth.

Opinions were asked as to the best operative procedure to be adopted in the case.

Dr. JOHNSON HORNE said the disease was more extensive than it seemed; the left cord was quite fixed. Nothing but complete extirpation of the larynx would be of any use.

Mr. B. ROBINSON agreed. The cervical glands, he thought, would be found enlarged right up to the base of the skull.

Mr. N. PATTERSON did not think that the disease was so extensive as had been supposed.

PRIMARY SORE OF THE VESTIBULE OF THE NOSE AND ADJOINING SKIN.

By Mr. NORMAN PATTERSON.

Female, aged thirty-eight. The patient came to hospital on January 6 with a hard, indurated, irregular area on the surface in the above-named region. The lesion gradually increased in size, and was accompanied by some enlargement of the glands in the submaxillary region. There had been a great deal of pain extending on to the face. Dr. Sequeira had found spirochaetes in the serum from the lesion, and a positive Wassermann reaction had been obtained.

LARGE GROWTH IN THE LARYNX.

By Mr. FITZGERALD POWELL.

Dr. H. J. DAVIS had found enlarged glands at the angle of the jaw.

Mr. B. ROBINSON agreed with Dr. Davis.

Mr. FITZGERALD POWELL said that at the first look the tumour seemed benign, but he now thought that the growth involved the arytenoids and the ary-epiglottic fold on the left side. He did not think that laryngectomy was possible, and intended to perform tracheotomy.

REMOVAL OF THE SUPERIOR MAXILLA FOR SARCOMA.

BY DR. H. J. DAVIS.

The specimen had been shown at a previous meeting,¹ and the patient was now exhibited.

The PRESIDENT congratulated Dr. Davis on the successful result.

TUBERCULOSIS OF THE NOSE IN A BOY, AND SWELLING OVER THE RIGHT SUPERIOR MAXILLA.

BY DR. WM. HILL.

The patient, after having been operated on for tuberculosis of the malar bone, had been treated in the Inoculation Department of St. Mary's Hospital for twelve months, but without any benefit. There was now tuberculous perichondritis of the nasal septum, and a sinus was present above the alveolar process leading into a diseased area in the maxilla. He asked how much should be done by way of operation, and whether a Roux or Denker operation was advisable.

Dr. PEGLER said that the case resembled one shown by him some time ago. He would cut the tuberculous area of the septum clean out, as he had done in his case with complete success.

INTERNATIONAL CONGRESS OF MEDICINE AT BUDAPEST.

September, 1909.

SECTION OF LARYNGOLOGY.

(Continued from Vol. XVI, p. 607.)

Papers and Discussion on Stenosis of the Larynx.

THE SURGICAL TREATMENT OF LARYNGO-TRACHEAL STENOSIS

BY DR. V. UCHERMANX (Christiania).

The author reported the results of his own personal experience and narrated illustrative cases. After fully discussing the many varieties of laryngeal and tracheal obstruction, the author described

¹ JOURN. OF LARYNGOL., RHINOL., AND OTOL., January, 1911, p. 31.

his methods of treatment. In the case of cicatricial stenosis these consisted in splitting the anterior laryngo-tracheal wall, and in retrograde dilatation of the stenosis by means of special instruments.

Dr. O. CHIARI had operated on several cases of stenosis by laryngo-tracheotomy, using after operation a new kind of dilator made of metal, and furnished with wing-like processes. In his cases he had succeeded, after laryngostomy, in re-constituting the lumen, and in preventing the formation of the spurs which so frequently appear on the posterior wall at the spot where the larynx merges into the trachea. He had not so far, however, been able to close the laryngostomy opening. The pressure of his dilating instrument rendered an extensive removal of scar-tissue unnecessary. First of all, following the Italian method, he inserted a wooden peg wrapped in iodoform gauze, and then proceeded to use his dilators, which, being well tolerated, were left *in situ* for several days. Finally they were removed together with the tracheotomy tube as soon as the newly formed canal was covered with epithelium. The patient was thus left with a laryngeal or tracheal opening of varying length, through which he could breathe without a tracheotomy tube. When he wished to speak he occluded the opening with his fingers. Dr. Chiari's cases included two children with intubation stenosis, and one man with cicatricial stenosis following a wound.

THE MECHANICAL TREATMENT OF STENOSIS OF THE LARYNX.

By DR. THOST (Hamburg).

This paper dealt with stenosis of the upper air-passages after tracheotomy. Two varieties of stenosis were distinguished: (1) Stenosis due to curvatures of the trachea. The presence of the tracheotomy tube in the tracheal opening pushing asunder the cut edges of the tracheal cartilages leads to a projection forward into the lumen of the tube of their free posterior ends, and to a consequent folding of the loose mucous membrane. In this way narrowing of the posterior wall of the windpipe is induced. Further, the tracheotomy tube leads to a doubling inwards of the severed ends of the divided cartilages in the neighbourhood of the wound, and so produces a narrowing of the anterior wall. (2) Stenosis from exuberant granulations. In all cases in which the tracheotomy tube remains in the trachea for any length of time more or less granulation-tissue is formed. The anterior wall of the trachea in the neighbourhood of the tracheotomy tube is converted into soft elastic granulation-tissue in such a way that the tube comes to lie in a canal formed of granulations, and the soft tissues and even the cartilages themselves are interpenetrated with the new-formed tissue. Both varieties of stenosis could be avoided if the old Dieffenbach plan of resecting a segment of the cartilages

were adopted, if a tracheotomy tube were dispensed with, or if soft rubber tubes, or tubes like Gersuny's or Durham's, were employed. Tracheotomy tubes should be small, short, and oval, not round.

When once the stenosis has formed it passes through three stages: (1) There is exuberant formation of granulation-tissue around the tube; (2) this exuberant granulation-tissue is transformed into scar-tissue; (3) the dense scar-tissue undergoes softening, and becomes fine connective tissue. In treating these cases exuberant granulations should be reduced with chemical caustics and the galvano-cantery, and by means of solid metal bougies introduced through the tracheotomy opening. His bougies correct the tracheal curvature besides reducing granulations, for, like Schrötter's bougies, they have the same shape as the normal larynx. He claimed for them the following advantages: (1) They are easily introduced even in obstreperous children, as each cannula has an obturator which permits it to be introduced without injury to the wound. (2) They rest securely in position; children can go about with them, to school, etc., and, as there is no thread in the mouth, they can eat and drink with perfect freedom. (3) They can be left in position for months, although the underlying cannula requires changing and cleaning. (4) In fracture and other injuries of the larynx where tracheotomy has to be performed, they may be used with advantage for the reposition of displaced parts. (5) They give very satisfactory results.

During the last twenty years he has treated in all fifty-four cases of stenosis after tracheotomy; thirty-two of these were less than ten years old and twenty-two were above that age. He had used his bougies in forty-one of them, the others being treated with Mikulicz's glass and rubber cannulae, with Schrötter's bougies and vulcanite tubes, with O'Dwyer's tubes and with the galvano-cantery. He had obtained the best results from his own pattern. Of the fifty-four cases six died of the original disease or its complications, three disappeared, and six were still under treatment. The remaining thirty-nine were all cured, twenty-eight by his own and eleven by other methods.

THE METHOD OF CICATRISATION OF LINEAR WOUNDS OF THE THYROID CARTILAGE.

BY DR. STRAZZA (Genoa).

The thyroid cartilage removed by laryngectomy from a patient who had been previously submitted to thyrotomy supplied the

material for the investigation. The following represented the findings of a histological examination of the cicatrix in the cartilage : (1) The wound in the cartilage is united by granulation-tissue, which is subsequently organised into fibrous connective-tissue, with here and there clumps of lymphocytes. (2) The cartilage bordering upon the wound undergoes alteration, amounting, indeed, to disintegration, while, on the other hand, from the perichondrium an active new-formation of osteoid tissue is evident. These regenerative processes are also widespread and pronounced in the region of the borders of the scar-tissue which forms the first union. To begin with, the new osteoid tissue is distributed like a scaffolding through the scar-tissue. Becoming stronger with time it finally knits the edges of the cartilage together in firm and permanent union. (3) This active process of reproduction is the work of the perichondrium, both external and internal.

Dr. BAUMGARTEN had successfully practised the following methods in laryngo-tracheal stenosis. In his first case he performed thyrotomy, excised the scar-tissue, threaded silk thread from the mouth through the cannula, and by attaching more and more threads and pulling them through endeavoured in this way to keep the lumen open. This plan proved to be unsatisfactory, however, so he had a Schrötter's cannula made half the size of the smallest No. 0. Thyrotomy having been performed again and the scar-tissue once more cleared out, the bougie, attached above to a silk thread, was introduced, pushed into the trachea, and fixed; then the larynx and trachea were sutured over it. To the external knob of the bougie another silk thread was fastened, passed through the tracheotomy tube, and firmly twisted from both sides round the flat portion of the tracheotomy tube. In this way the bougie was firmly anchored. Ten days later it was removed and a No. 0 inserted and fixed in the same way, and so on, larger and larger bougies being inserted at shorter and shorter intervals, until at last an O'Dwyer's tube—child's size—could be introduced. When this stage was reached the tracheotomy tube could be laid aside. His plan now was to insert the bougie immediately after thyrotomy.

Dr. MASSEI (Naples) had had remarkably good results with plugs of compressed cotton-wool in place of rubber, a device introduced by Prof. Ferreri, of Rome. He had had considerable experience of laryngostomy, and while he recognised its value in cicatricial cases in which it was impossible to pass any tube, he held that in papilloma, on the other hand, laryngostomy was inadvisable. Papillomata were no doubt very obstinate, but with time and proper care they ultimately disappeared. Cautious curettage, the application of "phenol-sulphuric acid," or the window-tubes could be employed. He had known cases in which the papillomata had not disappeared in spite of thyrotomy and laryngostomy.

Dr. BROECKAERT (Ghent), referring to Glück's comparison of exploratory laryngostomy with exploratory laparotomy, said that the former was applicable to little children, in whom it was difficult or impossible to discover the cause of the progressive stenosis. He had operated on three cases for this reason. In the first case he found, after laying the larynx

and trachea freely open, that "the cause of the laryngeal spasm was a narrowing from swelling of the mediastinal glands." Seeing that the obstruction was not caused by any laryngeal condition, he sutured the skin to the tracheal mucosa and closed the laryngeal opening—that is to say, he contented himself with a tracheotomy. In three months the patient was quite well. In his second case laryngo-tracheotomy revealed a granuloma in the trachea, and as he was able to remove it he closed the larynx at once. Finally, in his third case, which was at present under treatment, examination had shown it to be a case of laryngeal spasm due to a suspicious catarrh of the larynx. Here he had performed laryngo-tracheostomy. He was speaking thus from his own personal experience, first, in order to direct attention to laryngo-tracheostomy as an exploratory operation, and secondly, in order to advertise the advantages of tracheostomy as opposed to tracheotomy in certain definite conditions.

[*Note*.—Prof. Gluck recommended "laryngo-fissure," not "laryngo-tracheostomy," as an exploratory procedure comparable to exploratory laparotomy (*Trans.*¹)]

Dr. WEIL (Vienna) dealt with a particular variety of cicatricial tracheal stenosis following tracheotomy in early childhood, the symptoms of which did not appear until puberty. Only a few cases had been recorded, among others one by Chiari. The appearance of a small goitre was the feature common to all, and this seemed to be the exciting cause of the difficulties of breathing. He had seen, in a girl of twenty, two cicatricial bands stretched from before backwards across the trachea in the neighbourhood of the third or fourth tracheal ring, and looking like a second pair of vocal cords in the position of adduction, the intervening space being only one or two millimetres. Treatment by dilatation was considered to be too risky, as even a moderately severe tracheitis had proved to be sufficient to threaten asphyxiation. He therefore turned his attention to the goitre, which he treated with "iodglycerin," and he also gave fibrolysin hypodermically. Relief of the symptoms had followed, but the further history of the case was unknown.

Dr. E. FLETCHER INGALS (Washington) said that two or three years after O'Dwyer had introduced his tubes, a little boy came under his own care on account of laryngeal stenosis produced by excessive cauterisation with chromic acid. He introduced the O'Dwyer tube, which was worn for two years, and he performed thyrotomy once or twice. When the boy was about fourteen Dr. Ingals made persevering efforts to dilate the larynx with O'Dwyer's tubes, beginning with the largest tube he was able to insert and working up gradually, until, after eight months, a free laryngeal passage was obtained. But a few days after the tube was laid aside the stenosis recurred, so that he was compelled to abandon dilatation by force. About this time a young woman with laryngeal stenosis from hereditary syphilis came under his care. There was present a membranous web joining the vocal cords. The membrane was split in the middle line and a large intubation tube introduced, which the patient wore for ten months. The stenosis completely disappeared and did not return during the several years that the patient remained under observation.

Dr. FINDER (Berlin), having alluded to the success which had attended modern methods for the cure of cicatricial stenosis following tracheotomy, drew attention to obstructions resulting from ankylosis of the crico-arytænoid articulations with the vocal cords in juxtaposition.

¹ JOURN. OF LARYNGOL., RHINOL., AND OTOL., vol. XXV, No. 11, p. 600.

For this condition intubation, dilatation with bougies, and fibrolysin were useless, and the only rational therapy would seem to be mobilisation of the ankylosed cartilages. Citelli's proposal, to extirpate the vocal cords in such cases, did not commend itself to his judgment, and had not, he believed, found any imitators.

Prof. KILLIAN recommended, especially after laryngostomy in children, the use of Brüning's rubber-sponge strips attached to thread. This material is non-irritating, and when accurately adjusted exercises quite sufficient pressure. The duration of the treatment seemed to be materially shortened when it was used.

Dr. NÉMAI (Budapest) described a case in which two cannulæ had been worn simultaneously. The patient had been hurriedly tracheotomised. When he took over the case the tube was lying close under the vocal cords, and seemed to have occasioned some perichondritis. A low tracheotomy was performed, and in order that he might facilitate the dilatation of the larynx he kept the upper opening patent by means of a short cannula. After the disappearance of the preliminary inflammation the upper opening was easily dealt with. The case was cured.

Dr. MOURE (Bordeaux), while agreeing that laryngostomy had proved to be worthy of a place in laryngological technique, held that its employment should be restricted. In children in whom tracheotomy had been performed too high, and had led, in consequence, to stenosis, the normal growth of the larynx frequently restored its lumen, so that it was possible to dispense ultimately with the tube. In like manner he held that laryngostomy was not indicated in glottic spasm, or in diffuse, recurrent papillomata. For these cases simple tracheotomy was generally sufficient, and as far as papillomata were concerned their removal *per vias naturales* or by means of thyrotomy led to radical cure.

Dr. UCHERMANN, in his reply, said that the chief difference between Thost's and his own methods, apart from the kind of instruments used, lay in the fact that he divided the anterior wall in nearly all cases, while Thost omitted this step. He believed that his method saved time and assured safety and success, as it did away with stretching and its consequent reaction and fever. Killian had remarked that little children did not tolerate hard instruments, because they set up too much irritation. This might be true, but only when thyrotomy was omitted. If the larynx was opened up metal bougies could be fearlessly used, because in that case they caused no irritation. With reference to local applications, he preferred, when it was necessary, trichloroacetic acid applied through the tracheoscope to lunar caustic or the galvano-cautery. He objected to Marschik's instruments as being too bulky.

Dr. THOST, in reply, said that fibrolysin, which was very useful in cicatricial stenosis, should be injected twenty hours before using bougies. His objection to rubber was that it soon became very offensive, and had to be frequently changed.

SPECIMENS OF MYXOMA OF THE NASAL CAVITIES AND BASE OF THE SKULL.

BY DRs. HAJEK AND POLYÁK.

FIBROMA OF ETHMOID WITH PNEUMATIC DILATATION OF THE CELLS.

By DR. CHIARI.

The report of this case was published in 1883 in the *Wiener medicinischen Jahrbücher*. The tumour was discovered *post mortem* accidentally. No clinical history had been obtained.

AMERICAN LARYNGOLOGICAL ASSOCIATION.

Thirty-second Annual Congress, held at Washington, D.C., May 3, 4, and 5, 1910.

JAMES E. LOGAN, M.D., of *Kansas City, Mo., President.*

(By courtesy of the *New York Medical Record*.)

First Day—Tuesday, May 3.

(Continued from p. 107.)

SYNDROME OF SPHENOPALATINE GANGLION NEUROSIS.

By DR. GREENFIELD SLUDER.

The anatomical connections of this ganglion gave disease evidence in the motor, sensory, sympathetic, and gustatory fields. In the sensory realm there was a wide and characteristic distribution of pain along definite lines. The neuralgia might appear at the root of the nose, in and about the eye, in the region of the ear, in the mastoid; it might run to the shoulder-blade, and in severe attacks to the axilla, arms, and fingers. There was an accompanying anæsthesia of the soft palate and of the pharynx as low down as the bottom of the tonsil, possibly in the lower and anterior part of the nose. Often in the motor field the soft palate was involved; the palatine arch might be lower on, and the uvula was often deflected from the affected side. The palate *raphé* was deflected in the act of swallowing from the affected side. There was diminished and delayed taste on the affected side for sweets, salt, and bitters, applied to the middle third of the tongue. Some patients showed a perverted sense of taste, while others were accompanied by salivation. Three of the author's cases had sneezing with profuse serous secretion resembling that seen in vaso-motor rhinitis. Cocaine to the nasal mucosa gave immediate

relief to some cases, and in recent cases of moderate severity the relief was permanent. Sometimes several applications of a strong solution were required. In moderate to severe cases of longer duration, that is, up to nine months, injections of alcohol into the ganglion had proved curative. In most cases three injections had been necessary. The application should be made at the site of the sphenopalatine foramen. Illustrative cases were reported.

Dr. H. P. MOSHER said that he had had during the past year some experience in cauterising the ganglion in vasomotor cases and in cases of asthma. His experience was summarised as follows: One case of intractable vasomotor rhinitis of years' standing was given a year's relief, and of three cases of asthma one was stopped for a week, one for two weeks, and one for two months, respectively.

Dr. J. GORDON WILSON said that while the changes in vasomotor and secretory functions were suggestive, the gustatory phenomena reported by Dr. Sluder were difficult to reconcile with our present accepted knowledge of the course of these fibres. The results of testing the anterior part of the tongue varied so much in healthy individuals that to obtain definite results in testing the test should be made both before and after operation. The absence of such a record lessened, he thought, the value of Dr. Sluder's findings.

INSTRUMENTS FOR DIRECT INTUBATION OF THE LARYNX.

SHOWN BY DR. HARRIS P. MOSHER.

Dr. J. R. WINSLOW had had experience with this method, which he strongly commended.

Dr. W. K. SIMPSON did not think that the method was superior to the old indirect method, which he thought enabled one to exert more pressure in cases of stenosis. He would like to know if anyone had had experience with the direct method in children?

Dr. J. P. CLARK had had experience with the direct method in a case of diphtheritic stenosis in a child. He had found Dr. Mosher's instrument very useful in introducing and removing the tube.

Dr. A. COOLIDGE, jun., thought we were working much less in the dark by the direct method.

Dr. SIMPSON said that the moment we put the tube in by the direct method we were obscured in our field as much as if we used the mirror.

EXOSTOSES OF THE ACCESSORY SINUSES.

BY DR. H. P. MOSHER.

He said it would seem that the growth of exostoses in this region was analogous as far as size was concerned to the growth of ovarian cysts. The exostoses arose from small structures, had small pedicles, and reached in the end a size much greater than that of the structure from which they sprang. The author's

specimens showed them to be equally common in the frontal and sphenoidal sinuses. They might exist either as mamillated region or a single knob-like projection. In the first form there was a generalised periostitis, in the second form there was a true exostosis. In the sphenoidal sinus there were, for the most part, needle-like spines. The author had seen them springing from all the walls of the frontal sinus but not from the floor. It would seem reasonable to believe that the large knob-like masses seen in the frontal were the result of repeated traumatism. The author had also seen several instances of haemorrhagic sinusitis. It was not hard to conceive of local areas of haemorrhage in the sinus mucosa; the bleeding resulted from rarefaction of the air in the sinus caused by the inflammatory closure of its duct. Given a small haemorrhage in the mucosa its organisation and subsequent ossification might start an exostosis. In the author's case of frontal sinus exostosis the mass was removed by morcellation, but he was inclined to prefer a burr driven by a dental engine.

RADICAL OPERATION ON THE MAXILLARY ANTRUM.

BY DR. W. L. BALLENGER.

He described a new operation on the maxillary antrum: (1) Incision, under cocaine infiltration anaesthesia, in the vestibule of the nares along the ridge formed by the naso-antral angle. (2) Elevation of the periosteum over the antral wall. (3) Removal of the naso-antral angle with rongeur forceps until the anterior angle of the antral space is opened on a level with the inferior meatus. (4) Removal of the entire naso-antral wall beneath the attachment of the inferior turbinate, through the opening at the anterior angle, with Wagner forceps; the still further removal of the heavy portion of the mass at the floor of the nose with a small mallet and chisel. An opening was thus made extending from the extreme anterior angle to the posterior extension of the antrum and from the floor of the nose to the attachment of the inferior turbinate. The claims made by the author for this operation were: (1) It was as radical as the Denker operation, as it affords complete access to the antrum for curettage, treatment, and inspection; and (2) it was a much more conservative operation as it did not injure or remove the inferior turbinal, and might be done with much less loss of blood and under local anaesthesia in a few minutes.

THE INFLUENCE OF THE AUTOMOBILE UPON THE UPPER AIR-PASSAGES.

BY DR. D. BRYSON DELAVAN.

He spoke of the advantages and disadvantages from a sanitary standpoint of the use of the motor car. By giving outdoor life, change of air, etc., it was of service, but as it was often employed it might cause great injury to the delicate mucosa lining the upper air-tract and might lead to serious colds. Sudden changes of temperature or rapid radiation of body heat might cause chill with its well-known results on the human body. Increased atmospheric pressure, especially when combined with cold, must of necessity exert important influences upon the respiratory region from the nasal cavities and their communicating passages to the ultimate vesicles of the lungs. The presence in the air at times of large numbers of small, winged insects and the volatile products of shrubs and plants were also irritating. Dust might be irritating from its mechanical dangers. The wearing of a respirator might avoid these dangers, but there was no satisfactory one in the market. The carelessness as to clothing of many fast drivers exposed them to peculiar perils. Excessive riding increased tinnitus aurium. In many subacute and catarrhal states motoring was undoubtedly beneficial, but should be contradicted in acute conditions. All things considered the final verdict seemed decidedly in favour of the automobile. The authority of life insurance did not discriminate against it, high medical authority commended it in kindred directions, and common-sense seemed to sustain it.

Dr. J. O. ROE (Rochester) had noted the lessening of sinus diseases in motor-car users since the invention of the wind-shield.

AUSTRIAN OTOLOGICAL SOCIETY.

Meeting May 30, 1910; Monats. f. Ohren., year 44, No. 6.

HOFERAT POLITZER *in the Chair.*

Abstract of Demonstrations, etc.

FISTULA OF THE CANAL; ACUTE INVASION OF THE LABYRINTH;
LABYRINTH OPERATION DURING THE ACUTE STAGE; RECOVERY.

BY DR. BONDY.

Mrs. M—— had been under the care of Neumann at the clinic for over two years with a chronic middle-ear suppuration. There

was a perforation situate near the periphery, the anterior part of which was bound down to the tympanic wall. The secretion was minimal in amount, and at times the ear was frequently quite dry. Whisper at 6-8 mm.; the other tests showed impaired sound-conduction. Very well-marked fistula symptom. Neumann had previously often noted acute exacerbations of the discharge, accompanied by severe giddiness and great depreciation of the hearing, but the patient had repeatedly declined the operation as advised.

One evening, after some fourteen days of recurrent slight attacks of giddiness, she suddenly became intensely giddy, vomited, and was sent to the clinic by her family doctor. Examination revealed the typical condition of acute labyrinthitis, horizontal rotatory nystagmus to the sound side whichever way the eyes were directed, complete deafness and absence of caloric response on the diseased side. Large collection of *debris* in the meatus. Mastoid process tender. Within two days Bondy exposed the tympanum. The bone was eburnated, and the middle ear and attic entirely occupied with cholesteatomatous material. A fistula, 3-4 mm. long, was found, with blackened edges in the convexity of the canal. Neumann's labyrinth operation having been performed, the case ran a completely uneventful course.

Bondy recorded this case by way of asking (1) When and how should an operation be performed for a fistula? and (2) How should one treat acute suppuration in the labyrinth? Scheibe had lately maintained that the fistula symptom in itself was not sufficient indication for operating, and should be treated conservatively. Bondy had expressed his opinion that the fistula symptom even by itself demanded the radical mastoid operation, and considered that this case upheld his contention. In the vast majority of cases the fistula symptom was associated with the presence of cholesteatoma, and it was generally admitted that one could not hope to completely relieve this condition by conservative methods, and that therefore an acute exacerbation had to be apprehended if such treatment were adopted, under which circumstances the danger of an invasion of the labyrinth was always very imminent, as, indeed, his case showed. Only by freely exposing the middle-ear cavity was it possible to check the suppurative process and eliminate the risk of labyrinthitis.

The radical mastoid operation alone is sufficient in cases where the fistula symptom is still obtainable; the fistula itself calls for no other special treatment.

The risks of the labyrinth operation in cases of acute labyrinthitis

thitis should not be set too high, to which the uneventful convalescence of his case bore witness. The labyrinth must, of course, be freely opened in order to afford good drainage, and he was accustomed to adopt Neumann's method in these circumstances. He submitted that the progress of the case in point afforded an entire condemnation of expectant treatment.

"MUCOSUS-OTITIS" WITH ABSCESS OF THE LYMPH-GLANDS AND
CARIES OF THE ZYGOMA.

By DR. RUTTIN.

Mrs. B. K——, aged forty, was first seen on March 31, 1910. Seven weeks before she had suddenly suffered with severe pain in the right ear, which up till then had been perfectly well. On the fourth day after its onset Prof. Pollak had apparently performed a paracentesis, and within some two weeks all symptoms of pain and tinnitus had gradually disappeared, but one week later the cervical glands suddenly became swollen, as now they also appeared at the examination. The mastoid process was found to be unaffected, and although there was no secretion in the meatus the tympanic membrane was greyish-red, but still permitted the landmarks to be made out.

The cervical abscess was opened and healed normally, but the tympanic membrane did not recover its normal transparency, and in addition a swelling occurred over the zygoma. As the pus from the cervical abscess contained Gram-positive cocci in pairs and in short chains, and tubercle was excluded, the condition was considered to be dependent on *Streptococcus mucosus*. Accordingly the mastoid was first exposed, but as the bone was found almost normal the incision was carried forward to the zygoma and an abscess opened in this situation. In the zygoma a fistula was detected which ran backwards into the zygomatic tubercle. The diseased bone in connection with this and bounding the meatus was removed. The wound healed uneventually. *Streptococcus mucosus* was found in the pus. Rutin regarded the case of interest as it exemplified so well the characteristic metastasis which occurred in connection with lesions resulting from *Streptococcus mucosus*.

DELAYED ONSET OF MENINGITIS AFTER AN OPERATION FOR
"MUCOSUS-OTITIS."

By E. RUTTIN.

A patient, aged forty, was admitted on April 11, 1910, with

the history that six weeks ago he had had a sudden attack of pain in the right ear, followed some days later with a discharge. For the last two weeks there had been pain behind the ear, but no headache, giddiness, or vomiting. The membrane appeared injected, but was not perforated, there was no suppuration, but the posterior-superior meatal wall was sagging. Details on the membrane were obscured, the mastoid was tender, the labyrinth intact. Temperature 38.4°C . A large amount of pus was found at an operation by a colleague in the mastoid, in which the sinus and bulb lay exposed. During the operation slight bleeding took place from the bulb. Nine days afterwards the patient was discharged, nothing of importance having occurred in the meanwhile. On May 18, 1910, the patient was brought to the clinic unconscious, with the typical picture of meningitis. Lumbar puncture gave a purulent fluid. The original operation was explored on the chance that some diseased cells had been overlooked, but all here was found healthy. Both cranial fossae were, therefore, laid open and the dura incised. On the next day the patient died.

Post-mortem.—Diffuse purulent leptomeningitis, slight dural hæmorrhage, a small recent thrombus in the commencement of the transverse sinus, a non-adherent thrombus situated laterally in the longitudinal sinus. In the pus from the meningeal cavity *Streptococcus mucosus* was found.

Ruttin says that it was unreasonable to suppose the patient had meningitis at the time of the first operation five weeks before his death, and that therefore the infection must either have taken place through the lesion of the bulb—a suggestion the autopsy contradicted—or during convalescence from the wound, and in the latter case it must have been caused by a separate infection of the dura and not by a mere extension of the disease, as the labyrinth was not involved. This case again illustrated the danger and peculiar character of the sequelæ to mucosus-otitis.

Amongst other commentaries in the discussion which followed, LEBERT said that this account corresponded with similar cases he had seen in which a mastoid operation had resulted in apparently complete relief, but after as much as three weeks in some instances meningitis had suddenly supervened, and in these cases *Streptococcus mucosus* had been found in the lumbar fluid.

AN INVESTIGATION INTO THE CAUSATION OF SEASICKNESS.

By R. BÁRÁNY.

Bárány had noted that whilst travelling on a "sea-sick" steamer

he had very unpleasant sensations in his stomach during the descents if he held the head vertically, but that if it were bowed forwards at an angle of 90° this feeling completely disappeared. This also corresponded with his experiences in a lift. He considered that from this observation one could deduce the dependence, in part, of the unpleasant sensations in sea-sickness on a stimulation of the utricle and saccule. In connection with this he urged also that as lumbar puncture afforded relief in many cases of giddiness, it was quite conceivable that in some severe attacks of sea-sickness this procedure might prove beneficial.

FREY submitted that the explanation of the relief from unpleasant stomachic sensations during the rapid descents on the railway was attributable to the fact that in bowing the head forwards it was the horizontal canal which was chiefly affected by the motion, and thus an impression was produced comparable to that which occurred in travelling forwards or backwards directly. As this latter was a sensation to which we were all well accustomed, the disagreeable sensations associated with a rapid descent were, so to speak, converted into those connected with ordinary locomotion.

NEUMANN was not prepared to admit that the sensations produced on the scenic railway were necessarily the same as those caused by sea-sickness, which latter, however, he well knew. During a very rough ocean passage he had had ample time and opportunity to analyse the symptoms of sea-sickness both on himself and his fellow-travellers. He had been able to detect no nystagmus, and had only noted the psychic conditions of oppression, slowing of the pulse-rate, nausea, vomiting and cold perspiration, all of which were referable to some stimulation of the vagus. The vestibular symptoms of vertigo and disturbances of the power of equilibration were present in all more or less, but were subordinated to those mentioned in the first group. As the horizontal position had proved the most comfortable both for himself and others, he had thought that perhaps the symptoms were due to cerebral anæmia, and he had attempted to combat this by wearing a rubber constriction band round his neck; but the effect did not corroborate his view—indeed, the sickness was more preferable. He had tried to overcome the vestibular symptoms by the application of galvanism in opposition to their apparent direction, and the current was used up to a point when it was no longer bearable, one pole being applied to the tragus, and the other to the umbilicus, and interchanged. No appreciable result, however, followed this treatment. He was unable to draw any definite conclusions from this small experience, but felt sure that bowing forwards the head could only very slightly influence the feeling of sea-sickness, which he considered was dependent on both vestibular and vagus impulses together, and both these features should be kept in view in the rational treatment of the malady.

RUTTIN had carried out experiments on himself much on the same lines as described by Neumann, and with much the same results.

BARÁNY, in reply, said that of course one could not expect any immediate improvement from the position of the head if one had already become sea-sick, the only logical application of his observation was as a prophylactic measure. In answer to Frey, he stated that the sensations

produced by a rapid descent were referable to the utricle and saccule, and certainly not to the canals, as by this movement no current could be induced in the endolymph, which only occurred during rotation, and that the fluid itself was incompressible. The utricle and saccule were the centres concerned with movements of the body in straight lines, and he had already demonstrated previously that if the head were bowed forwards the motion of the body upwards or downwards would give the impression of a movement forwards or backwards respectively.

[This statement of Bárány's must not apparently be accepted without some reserve—though it is with great diffidence one presumes to criticise so accurate an authority—since if the utricle and saccule are alone concerned with movements of the body in straight lines, and if by bending the head forwards at an angle of 90° the experience of a rapid descent is enabled to be construed into an impression of motion backwards in the horizontal plane, then it would appear that the converse should also hold good—that is, with the body in a supine position, or if in a sitting or standing position with head bent forwards at an angle of 90° , and carried forwards through space in the horizontal plane at a rapid rate, this motion should be construed as one in a downwards or upwards direction, according as to whether the body is travelling head or feet first, or forwards or backwards.

Or the problem may be represented more graphically as follows:

Hypothesis.—When standing or sitting with the head inclined at an angle of 90° —

Downwards gives the impression of backwards,

Upwards " " forwards.

Conversely, standing or sitting with head inclined at an angle of 90°

Forwards should give the impression of upwards,

Backwards " " downwards.

And if lying in the supine position, motion—

Head first should give the impression of upwards,

Feet first " " downwards.

These conditions occur on an ordinary railway train, and though it is true that the speed is varied gradually, still a sudden alteration in the position of the head or body should provoke the equivalent of a sudden alteration of direction; and yet it is difficult to believe that such effects are produced as will support the above theory. One would also have expected that a rapid downward motion with head at 90° should have occasioned an idea of forward movement in the horizontal plane, and the other movements varied respectively. It would seem that some further qualifications as to the function of the utricle and saccule are necessary, or that there are other factors which contribute towards the perception of motion in straight lines.—A. R. T.]

POLITZER remarked that the observation that no nystagmus was observed in sea-sickness was most important, and wished to associate himself with Neumann's view that in this condition the vestibular apparatus played a very small part.

A CASE OF DEAFNESS FOR CONVERSATION, WITH PECULIAR VESTIBULAR REACTION.

BY NEUMANN.

The patient, in spite of intact membranes, was completely deaf

on both sides to conversation. As regards the tuning-fork tests, perception for the lower tones up to the small octave was completely absent, and from thence to the high tones there was very considerable depreciation; bone-conduction was present. Periodical attacks of giddiness also occurred, which, though at first slight, had in the last three weeks become almost unbearable. No response whatever was obtained by the caloric tests, but there was a prompt reaction to both rotation and galvanism. The condition was the same on both sides. The patient had declined any operation, but had been kept under observation for some two years, during which time the hearing had become worse still, and nystagmus could now quite easily be provoked with the slightest movement of the head.

After referring to some other somewhat similar cases, Neumann remarked that for this extraordinary group of symptoms he was only able to offer, as a mere suggestion, by way of explanation, some recurrent alterations in the consistency of the fluid contents of the labyrinth, such as might, for instance, be the result of inflammation or hæmorrhage or some other, as yet unknown, conditions. As, however, time did not then permit, he would defer any further remarks as to the pathology of these cases till the next meeting.

ALEX. R. TWEEDIE (*trans.*).

Abstracts.

NOSE.

Baumgarten, Egmont (Budapest).—*Impairment of Vision due to Intra-nasal Conditions.* "Monats. f. Ohrenheilk.," Year 44, No. 9.

The report of the following cases forms the subject of this article, preceded by a brief introduction.

A woman, aged sixty, was referred from the eye department with the story that her sight had been failing for two weeks and that now she could not distinguish people in the street. Right eye, myopic vision $\frac{3}{60}$, improved with concave glasses to $\frac{5}{60}$. Left eye vision, $\frac{1}{40}$, chronic papillitis passing on to atrophy. Intra-nasal examination: The left middle turbinal was enlarged towards its hinder portion and almost engaged the septum. Apart from this no abnormality was detected.

Under cocaine the sphenoidal sinus could be reached by displacing the left middle turbinate outwards and its anterior wall broken down: although no pus or even serous fluid was found the patient at once stated she could see better. On account of this improvement and with a view to affording permanent relief the left middle turbinal was removed. The next day the patient reported that her sight was still better and that she

could then recognise people. Vision in both eyes $\frac{5}{30}$. The sinus was kept open a short while and the oculist reported that the papillitis had improved, and that she could read "No. 13" with glasses corresponding to her presbyopia.

The author considered that the causal relation between the nose and impairment of vision was established by the result of this treatment in spite of the fact that neither pus nor serous fluid was found in the sphenoidal sinus, and concludes that relief of some circulatory disturbances must be the explanation.

Snellen and Quix in Utrecht had reported on seven very similar cases which had come under their notice in the last two years.

A second case was that of a woman, who twenty-four hours before had become blind in the right eye, the fundus of which, however, showed no departure from the normal. A very slight enlargement of the middle turbinal was the only noteworthy point in the intra-nasal examination, but in the light of the previous case this was removed, and as no improvement in the vision then occurred the sphenoidal sinus was opened. No pus or serous fluid was found, but the mucous membrane felt very swollen to the probe. The third day after the patient could count fingers, but a papillitis had developed. She, however, was so content with the improvement that she declined any further treatment for the present.

Yet another similar case referred to a girl, aged twenty, who four months before had suffered with severe headache, and within three days had completely lost the sight in the left eye. She could hear no one near her and every known remedy was tried without avail. No disease of the nerves could be found, and the case was sent on by the oculist to the author with the report: "The right eye intact; myopic astigmatism. The left eye showed a particularly pale disc without signs of general papillitis; pure pressure atrophy. Irregular central scotoma with a definite boundary in which certain objects could still be recognised. Marked divergent strabismus."

The only point worthy of note in the nose was an enlargement of the posterior end of the left middle turbinal which engaged the septum. This, on account of the severe and persistent headache, was removed. As no improvement had followed this procedure by the next day the sphenoidal sinus was laid open. No pathological contents were found but the sinus was very small, and its mucous membrane so swollen that a portion of it could be easily removed. The headache was much improved the day after, had completely disappeared in five days, and the patient stated that the "darkness" in the left eye was clearing up. The strabismus was also considerably improved. Within a month the oculist stated the scotoma was much smaller but the fundus appearances remained the same.

For two months the patient was continually under observation. Headache occurred from time to time, but always less in severity, and on each occasion the removal of granulations from the stump of the turbinal or from the sinus effected an immediate relief. She also reported that her vision improved from day to day, and she could now walk in the street with the right eye closed.

She was sent home and returned in about six weeks very pleased with a further return of sight, looked exceedingly well, and had had scarcely any headache. A slight recurrence of these symptoms, however, necessitated a repetition of the above treatment, and means were also adopted to ensure against granulations re-forming by a radical operation on the ethmoidal cells and enlarging the opening into the sphenoid sinus. Five

months after the original operation the oculist reported that the scotoma was now for colour only and that she could count fingers at one metre. No further improvement took place, probably because this was an old amblyopic eye. Vision in the right eye $\frac{5}{50}$; improved by 3-5 D. to $\frac{5}{15}$. Strabismus almost disappeared. Headache on the affected side gone, but still some referred to the other side. The patient attended a short while longer. At the time of writing she could distinguish a red cross. (Four perimetrical charts illustrate this case.)

From the results of these operations Baumgarten submits that it is always worth while to carry out such treatment in both acute and chronic cases, even if no definite objective reason can be found in the nose, affections of the other sinuses being of course previously excluded as far as possible.

A fourth case relates to a woman, aged forty, whose vision in the right eye had progressively become worse during the last two months, and was associated for the last week with severe headache. Right eye, vision $\frac{5}{50}$; left eye, $\frac{5}{7}$. Subacute papillitis of the right eye. Visual field normal, even for colours.

Examination of the Nose.—Enlargement of the hinder ends of both middle turbinals, which almost engaged the septum and felt like bone. This enlargement on the right side was removed under cocaine, and found to consist of an extensive bony cyst, the interior of which contained soft granulations. When the patient had recovered from the operation she was taken at once to the oculist, who found that the vision could then be improved with 2 D. to $\frac{5}{15}$. The next day the headache had gone, and the vision still further improved, but in the meantime a papillitis of the left eye had appeared—a condition not very surprising when the result of the intra-nasal inspection on that side is recalled. As, however, the sight was unaffected, and no headache supervened, operation on this side was postponed, and as this treatment alone effected all that was necessary the sphenoid sinus was not opened. The author concludes from this case that an enlargement of the turbinal may thus be the cause of papillitis.

The fifth case was a man, aged twenty-four, sent to the author with an acute papillitis of the right (? left) eye; vision normal; an absolute paracentral scotoma varying between 10° and 20° . Patient said he could see well, but that for some weeks it appeared as if he saw everything through a cloud. At times he had had severe left-sided headache.

As the posterior end of the left middle turbinal was enlarged it was removed, and on the posterior ethmoidal cells being laid open in order to gain sufficient space they were found to be filled with granulations. Immediately the patient said the headache had ceased, and that it seemed as if the veil before the eye had been taken away. No remains of the scotoma could be detected after a few days, and the vision a little later was normal, but as he still had intermittent attacks of headache he was told that if these became severe he was to report himself so that the sphenoidal sinus could then be opened.

Case 6 was a man, aged thirty-four, who had partially lost the sight of the right eye a long while. The field for white was concentrically narrowed; central scotoma for red and green. Vision: right, can count fingers at $1\frac{1}{2}$ metres; left, $\frac{5}{7}$. A slight engorgement of the veins was seen in the right fundus. Nothing abnormal was seen after cocaineising the nose until the right middle turbinal was pressed outwards, when a drop of pus was observed on the lower part of the anterior wall of the sphenoidal sinus, which reappeared when swabbed away. For this reason the sinus was opened and some thick pus evacuated. After the operation

the vision improved to $\frac{5}{70}$, and in sixteen days to $\frac{5}{60}$. The scotoma for white almost disappeared, but persisted for colours.

In the last instance given, a woman, aged thirty, had slowly been losing the sight in the right eye. Vision: right, $\frac{5}{50}$; left, $\frac{5}{5}$. Fundus normal; central colour scotoma.

The right middle turbinal was found polypoid and engaging a deviation of the septum. On the left side of the septum opposite the deviation was a soft rounded swelling, which was easily removed with a snare, but so much bleeding resulted that the nose had to be packed some days and eventually cauterised with chromic acid. The patient, however, stated she could see better. Vision now $\frac{5}{30}$.

She was seen again in eight days, when, as a large ulcer had reappeared on the left side at the site of the former removal, the condition was diagnosed as due to lues and the patient put on iodide. In ten days' time the ulcer had disappeared, and the right side had also yielded to this treatment.

The oculist now reported: "Vision, right, $\frac{5}{5}$; no colour scotoma to be noted." Baumgarten considered that this result could not be attributed to the cure of the intra-nasal conditions alone, but that probably a gummatous deposit around the optic nerve had also responded to the general treatment.

In the light of the results obtained in these cases the author urges the necessity of submitting instances of both acute and chronic papillitis to a rhinological examination.

Although he is evidently quite satisfied himself as to the relation of cause and effect in the non-purulent cases, the description is rather disappointing, and the data regarding the alleged improvement of vision somewhat unconvincing.

Alex. R. Tweedie.

Burkett, H. S. and Meakins, J. C.—*The Value of Vaccine Treatment of Chronic Inflammatory Diseases of the Accessory Sinuses of the Nose.* "Boston Med. and Surg. Journ.," December 22, 1910, p. 957.

The authors conclude that vaccine treatment will sterilise the accessory sinuses of the nose when the subject of chronic disease. That the chronic discharge of mucus from the accessory sinuses of the nose is not so much due to bacterial infection as to habit hypersecretion. That the symptoms are not due to infection, but to hypersecretion and retention. That although vaccine therapy is a valuable adjunct to treatment, the establishment of free drainage by the removal of polypoid masses and redundant mucous membrane is more important, and that the cases of sinusitis showing a tendency to become chronic should be treated early by homologous vaccines.

MacLeod Yearsley.

EAR.

Weis, J. (Frankfort-on-Maine).—*An Example of Rupture of the Tympanic Membrane in a Telephone Operator.* "Arch. f. Ohrenheilk.," Bd. lxxix, Heft 1 and 2, p. 103.

The patient, a girl, was rung up by a subscriber while in electrical contact with him. Immediately after she noticed pain and tinnitus in the affected ear, the left, and when the author saw her on the following day the membrane presented a rupture similar in appearance to that which results from a blow on the ear. Under appropriate treatment healing and complete restoration of function followed.

According to the author there are three ways in which the injury

might have been produced: (1) Rapid turning of the handle of the instrument by a subscriber who is already in electrical connection with the operator agitates the disc in the operator's ear-piece so violently that, if the ear-piece is closely applied to the operator's ear, it may increase the pressure of air in the meatus so much as to tear the membrane. (2) If the wires of two subscribers who are ringing come into accidental contact, a similar result is brought about. (3) If the disc in the ear-piece is a little bent the ordinary oscillation may cause it to emit a loud snap or crack. By way of preventing these accidents he advises the general adoption of the more recent mode of calling up the exchange by simply removing the ear-piece from the stand.

Shocks from lightning during a thunderstorm cannot take place in Frankfort for the wires are underground. Blegvad's paper on this subject, an abstract of which has already appeared in the JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY,¹ is quoted.

Dan McKenzie.

Kopetzky, S. J.—*Results of Autogenous Vaccine Therapy in Acute and Chronic Middle-ear Suppurations.* "New York Med. Journ.," October 15, 1910.

The author reports fifteen cases of purulent otitis media treated with autogenous vaccines, and concludes that such vaccines are valuable in cases where subsidence of bacterial activity means the end of the lesion. In acute cases, after the period of violent onset with constitutional symptoms has passed, the added immunity acquired through vaccine therapy seems rapidly to cure the diseased ear. In cases with bone lesions the vaccines had no effect.

Macleod Yearsley.

Rudloff, W. (Wiesbaden).—*Extra-dural Abscess with Disturbances of Speech.* "Arch. f. Ohrenheilk.," Bd. lxxix, Heft 1 and 2, p. 112.

The patient, a girl, aged sixteen, had suffered from chronic suppuration of the left ear for four years. The illness for which the author was consulted began with headache, vomiting, and shivering; somnolence and speechlessness rapidly followed. The left ear was found to be full of pus, and the membrane was absent. There were no signs of inflammation over the mastoid, and percussion of the mastoid and side of the head did not elicit any complaint of pain. There were no changes in the fundus oculi. Temperature 38.3° C.; pulse 96. The radical mastoid operation having been performed, the middle cranial fossa was opened by removing the roof of the antrum and tympanum, and an extra-dural abscess was evacuated. The dura was thickened, and the bone was removed until healthy dura was reached. Cerebro-spinal fluid obtained by lumbar puncture was normal. For two or three days after the operation motor and sensory aphasia persisted, the patient being unable to answer questions or to name articles. But by the fourth day the mental dulness had considerably cleared up, and the patient began to speak. Later on a continuance of the purulent discharge from the middle fossa induced the author to remove a large portion of the squamous bone. Recovery followed.

The aphasic symptoms are referred to the toxic influence of the abscess upon the sensory speech area in the temporal lobe and upon the convolutions of Broca, and not to the effects of pressure. The author excludes cerebral abscess because all other signs of cerebral abscess were absent. The temporal lobe, however, was not punctured.

Dan McKenzie.

¹ Vol. xxiv, p. 172.

Theobald, S.—*Reflex Aural Neuroses from Eye-strain.* "Journ. Amer. Med. Assoc.," July 10, 1909.

The author has observed three distinct varieties of tinnitus due to eye-strain, the more usual or vascular type, the relatively low-pitched whirling or fluttering sound caused by irregular contractions of the tensor tympani, and the high-pitched, almost musical, intermittent tinkling produced by contractions of the stapedius. The evidence in favour of the ocular origin of the aural sensations mentioned is their disappearance after the relief of the eye-strain, their greater intensity when the eye-strain is most troublesome, or their appearance or aggravation by use of the eyes. The ocular fault most often present is astigmatism. The tinnitus is probably explained by vaso-motor disturbance of the intralabyrinthine vessels.

Maclead Yeatsley.

MISCELLANEOUS.

Stepinski (Paris).—*Lactic Acid in the Treatment of Ozaena and Otorrhœa.* "Arch. Internat. de Laryngol., d'Otol., et de Rhinol.," July–August, 1910.

The author mentions several cases in which dry lactic acid ferment on gauze was used in his clinic with gratifying results in the above cases. He cleanses the parts of all scabs and other foreign material, and then makes daily application of the ferment.

He believes this treatment is applicable to several other conditions, such as sinus suppurations, pyorrhœa alveolaris, stomatitis, fœtid breath, etc.

Anthony McCull.

Hunt, J. Ramsay (New York).—*The Symptom-Complex of the Acute Posterior Poliomyelitis of the Genuiculate, Auditory, Glosso-pharyngeal and Pneumogastric Ganglia.* "The Archives of Internal Medicine," vol. v, June 15, 1910.

A study of the symptomatology, complications and various clinical combinations of acute posterior poliomyelitis (herpes zoster) of the peripheral root ganglia of the facial, auditory, glosso-pharyngeal and vagus nerves. The ganglionic structures concerned are the genuiculate of the seventh, the ganglion of Corti and the ganglion of Scarpa of the eighth, the ganglion petrosum (Andersch) and the ganglion of Ehrenritter of the ninth, the ganglion jugulari and the ganglion plexiforme of the tenth. All these structures originate from the *neural ridge*, in common with the posterior spinal ganglionic chain, and are, therefore, susceptible to the specific inflammatory reactions of herpes zoster (herpetic ganglionitis or posterior poliomyelitis).

The subject-matter is considered under the following general headings:

(1) Report of personal cases of herpes zoster oticus. Clinical abstracts of nine cases with herpes zoster oticus, in which the eruption was distributed in the genuiculate area in seven, and in the vagal zone in two. Facial palsy was present in six of the cases, and a unilateral paresis of the soft palate in two.

(2) The zoster zones of the genuiculate, glosso-pharyngeal and vagal ganglia on the external ear (herpes zoster oticus). An attempt is made to differentiate the zoster zones on the external ear by the herpes zoster method.

(3) The paralytic complications of herpes zoster oticus. These consist of facial palsy, auditory symptoms (deafness and Ménière's

syndrome), paresis of the soft palate and symptoms indicating irritation of the pneumogastric nerve.

(4) The zoster zones of the glosso-pharyngeal and vagal ganglia within the buccal cavity (herpes zoster pharyngis and herpes zoster laryngis).

(5) The complications of herpes zoster pharyngis and herpes zoster laryngis. Among these are facial and palatal palsies, auditory and pneumogastric symptoms.

(6) Herpes zoster of the tongue with facial palsy.

(7) Posterior poliomyelitis of the auditory ganglia. A consideration of the auditory symptoms complicating herpes zoster of the cephalic extremity, also of the posterior poliomyelitis of the auditory ganglia *without herpes zoster*.

(8) The paralytic complications of herpes zoster facialis and herpes zoster occipito-collaris.

(9) Concluding remarks.

From the evidence which has been presented I believe that we are justified in isolating a large and varied group of cases, characterised by herpes zoster of the cephalic extremity, associated with facial palsy, auditory, glosso-pharyngeal and pneumogastric symptoms, and in regarding them as constituting a well-defined clinical picture. A number of syndromes are thus united in a symptom-complex, having a common aetiology and pathology.

The neural complications may occur singly or in various combinations, depending on the degree of the infection and the localisation of the inflammatory process. Because of the tendency to invasion of more than one ganglion in cephalic zona neural complications may occur, even when the eruption is situated in the distribution of a ganglion situated above or below that causing the paralysis. In this event the nerve complication is caused by an inflammatory reaction in the ganglion of the affected nerve sufficient to cause a transient palsy, but not to produce an eruption.

The general symptoms may be very mild or they may reach a high degree of severity, in consequence of which a considerable variation in the clinical picture results.

The neural symptoms are often singularly transient in their duration, all trace disappearing within a few days or a fortnight. Not infrequently permanent structural changes take place with persistent disturbance of function.

As is well known, paralytic complications may occur in other parts of the body in zona, notably of the ocular nerves, but also in the distribution of the spinal nerves. These are comparatively rare, probably because the inflammatory lesions are limited by the capsule of the ganglion, and in order to reach the motor nerves of the eye in Gasserian involvement or the anterior root in that of the spinal ganglia the inflammation must first break through this fibrous wall or travel for some distance along the course of the sensory nerve. The capsule of the ganglion therefore forms a natural barrier and protection against the extension of the inflammatory process.

Anatomical conditions are different, however, in the ganglia under consideration. Here the fibres of the seventh, eighth, ninth and tenth nerves are in more immediate relation to the cell-structures of their respective ganglia and are not separated by an intervening fibrous wall.

For this reason very slight inflammatory reactions within these ganglia jeopardise their respective nerve-fibres. This intimate association of ganglionic structure and nerve-fibres would account, not only for those

eases with light and transient symptoms, but also for those of a more severe grade, with lasting impairment of function.

In my study of this group of cases I have encountered none in which a fatal issue could be attributed directly to the disease itself. It is well known that a unilateral lesion or section of the vagus is not necessarily dangerous to life; and as herpes zoster is usually unilateral pneumogastric involvement on one side would not be fatal. If, however, bilateral zona of the cephalic extremity should occur, involving the ganglia of the pneumogastric nerves on both sides, dangerous symptoms, or even a fatal termination, might result. It is perhaps significant in this connection to recall the wide-spread belief among the laity of the fatal tendency of bilateral shingles. Possibly we have here an explanation for a tradition which is common to all nations.

I would also emphasise the fact that in my study of this subject I have found no cases with facial, auditory, glosso-pharyngeal or pneumogastric nerve complications accompanying an eruption of herpes zoster, except when situated on the cephalic extremity of the body, *i. e.* herpes facialis, oticus, pharyngis, laryngis, lingualis, and occipito-collaris. That such neural complications do not accompany an eruption in the lower segments of the body is readily understood from the tendency of the posterior poliomyelitis to limit itself to a small series of ganglia, usually only one or two. In severe forms of infection, however, with extensive involvement of the cerebro-spinal chain or ganglia, there is no reason theoretically why cranial nerve-palsies may not occur.

It is my firm conviction that cases belonging to the group which I have just described are of much more frequent occurrence than might be inferred from the study of our literature, the reasons for which are to be found in the smallness and inaccessibility of the eruptive areas, making their detection difficult, or all traces of the eruption may have disappeared before the case comes under observation, when a retrospective diagnosis might be difficult or impossible.

It also seems probable that some cases which are interpreted as rheumatic palsies of the face, palate, and even the larynx, may belong to this group, as well as toxic unilateral palsies of obscure origin. This, I believe, is also true of unilateral affections of the auditory nerve.

Author's Abstract.

REVIEW.

A Practical Guide to the Newer Remedies. By J. M. FORTESCUE-BRICKDALE, M.A., M.D. Bristol: John Wright & Sons, Ltd. London: Simpkin, Marshall, Hamilton, Kent & Co., Ltd., 1910.

Dr. Fortescue-Brickdale's "Guide to the Newer Remedies," although intended chiefly for the general physician, contains much matter of interest to the specialist, as, for instance, the discussion of the various iodoform substitutes, the vaso-constrictors, the direct local anæsthetics, and the specific remedies for phthisis, as also for functional disorders. The index occupies six and a half double-column pages made up of little else than the names of these newer remedies, and it would be strange if any reader failed to find in this list some with which he was unacquainted.

Among the vaso-constrictors we note the pituitary extract, and among the hypnotics we see isopral, a remedy which will sometimes relieve otherwise intractable tinnitus, classified as among the most dangerous.

being grouped with tetronal, chloralose, and chloral-urethane. Scopolamine receives comparatively little praise, apart from the fact that under its cognomen of hyoscine it has acquired rather a sinister reputation.

The number of antipyretic drugs is quite startling, the acetanilide group being credited with acting directly on the thermotoxic centre and being, therefore, antipyretic in the true sense of the word. They are, of course, derivatives of aniline, among the more important physiological effects of which is the extensive breaking down of the erythrocytes and the liberation of hæmoglobin in the blood (p. 211). Exalgin is not recommended. Cinnamate of guaiacol is considered superior to the carbonate. Hetol receives praise, but the advantages of the use of celtropin and vanadic acid are not very obvious.

The remedies for functional nervous disorders are chiefly compounds of valerian, such as valyl, bornyval, and validol. The writer considers them very little preferable to the ammoniated tincture of valerian, but it can scarcely be said that this has the "mild, pleasant odour and refreshing taste" with which validol is credited. The newer purgatives, urinary antiseptics and other general remedies are dealt with in an interesting and instructive way, and the book cannot fail to meet with a large demand.

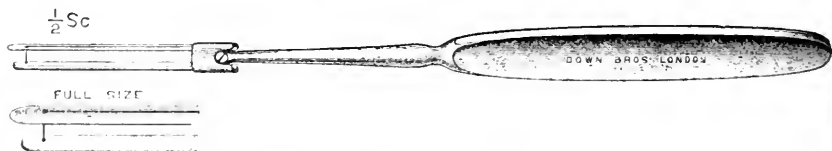
D. G.

NEW INSTRUMENTS.

AN INSTRUMENT FOR SUBMUCOUS RESECTION OF THE CARTILAGINOUS NASAL SEPTUM.

Designed by Thomas H. Pinder, Hon. Surgeon to the Manchester Ear Hospital.

The usual fixed or swinging blade is here replaced by a fine steel wire. Advantages claimed are, that no sharpening is needed, that a thinner or thicker wire can be used at discretion, that, in a narrow nostril, the compressible tips are self adjusting, and the space between them is wide enough to take cartilage of varying thickness. The longer of the two blades should engage the right side of the cartilage first when introduced from the left, as is usually most convenient. The cut is well under control, and readily follows the outline of the vertical plate of the ethmoid and of the vomer in withdrawing forward.



Directions for Refilling.—Take not less than eight inches of wire; with pliers bend about the middle to a right angle. Thread one end up to the angle through both holes across the tips, compress these with the fingers to something less than the width eventually required, and still holding them so, bend the projecting straight wire also to a right angle and cross both free ends through the hole bored through the stem; pull both tight, fix with the set-screw, and cut off the protruding ends quite closely. The tips when released from pressure will spring outwards, and the wire should then fit closely in the groove on the outer side of each.

THE
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**REPORTS FOR THE YEAR 1909 FROM THE EAR AND
THROAT DEPARTMENT OF THE ROYAL INFIRMARY,
EDINBURGH.**

Under the charge of A. LOGAN TURNER, M.D., F.R.C.S.E., F.R.S.E.

III.—A CONTRIBUTION TO THE QUESTION OF OZÆNA.

BY J. S. FRASER, M.B., F.R.C.S.E.,

Assistant Surgeon; and

F. ESMOND REYNOLDS, M.B.

INTRODUCTION.

THERE are few subjects about which there is still so much dispute as the question of ozæna. On the nature of the histological changes in the nasal mucosa, and also in regard to bacteriology, there is at least a measure of agreement, but marked differences arise when an attempt is made to draw inferences from the findings. Numerous papers dealing with the ætiology and pathology of the condition lead to different conclusions or fail to arrive at any definite result, while the methods of treatment, in so far as they aim at curing the condition, and not merely palliating its disagreeable consequences, are widely divergent and attended by no great measure of success.

In this paper we propose: (1) To give an analysis of 138 cases of ozaena and 22 cases of purulent rhinitis which have come under observation in Dr. Logan Turner's department during the years 1907-10; (2) to give the result of the histological investigation of three cases made by one of us (J. S. F.); (3) to analyse the work that has been done in regard to the bacteriology of ozaena, and to add a few observations that have been made in the Pathological Department of the Royal Infirmary; (4) to review briefly the chief work that has been published and the most important theories that have been advanced on the nature of the condition; (5) to state the conclusions we have drawn from a review of the literature of the subject as well as from our clinical, microscopic, and bacteriological observations.

1. THE CLINICAL ANALYSIS OF ONE HUNDRED AND THIRTY-EIGHT CASES OF OZENA.

Sex.—Of our 138 cases 80 were females and 58 males. Lack states that three fourths of ozaena cases are females. Wingrave, Macdonald, and Gerber arrive at much the same result; Steiner, in an analysis of thirty-four cases, dealt with twenty-five women and only nine men. It will be seen that our own statistics do not point to such a marked preponderance of the female sex as those of other writers.

Age.—Our figures give the ages at which the cases were observed and not the age of occurrence of the disease. It was found to be impossible to obtain accurate information in regard to the time of onset of the condition: 5 to 9 years, ten; 10 to 14 years, sixteen; 15 to 19 years, twenty-five; 20 to 24 years, twenty-six; 25 to 29 years, fourteen; 30 to 34 years, twelve; 35 to 39 years, fourteen; 40 to 44 years, six; 45 to 49 years, eight; 50 to 54 years, five; over 54 years only two cases. Of Steiner's 34 cases 21 were under twenty years. Wingrave found that 34 out of 60 cases began under the age of five years. Out of the 150 cases recorded by Lack 40 commenced under five years, and in only 9 per cent. did the trouble commence under eighteen.

Symptoms.—The usual symptoms were nasal obstruction and crust formation, but some of the patients complained of nasal discharge and of bad taste and smell. In almost all cases the patients' relations and friends stated that there was a bad odour from the patient's breath. Three of our cases complained of asthma, and several of hoarseness and ear trouble; seventeen

patients mentioned frontal headache, while in four the pain was in the occipital region; in two behind the eyes; in one the pain was on the vertex. In three the pain was referred to the ears (which were normal), and finally, in five cases the bridge of the nose was the seat of pain. Epistaxis was complained of in fifteen cases. The sense of smell was noted in forty-six cases, thirty-two patients complaining of loss of smell, while fourteen stated that they retained this sense. Twenty-three patients complained of a bad smell in the nose. The typical ozaena odour was noted by the observer at the time of the first examination in all but nine cases, but, in the latter, there was a history of bad smell, and in several the odour was noted on subsequent occasions. It is generally agreed that the offensive odour is due to decomposition of the discharge. Lack states that it is absent if the nasal cavities be packed after thorough cleansing, and we are able to confirm this statement in cases in which antiseptic treatment was rigorously carried out. All of Steiner's thirty-four cases had crusts and fœtor.

Causation.—It was impossible in many cases to obtain any information on this point. A history of purulent rhinitis in childhood was obtained in twenty-six cases; twenty-six were apparently set up by congenital or acquired syphilis, two by tubercle, four by diphtheria, and three by measles.

The Presence of Similar or Allied Affections in Other Parts.—Pharyngitis sicca was noticed in forty-six cases, laryngitis in twenty, and suppurative otitis media in thirteen cases. Several of the patients were sent for examination from the Eye Department on account of dacryo-cystitis and corneal ulceration and other eye troubles. Steiner noticed errors of accommodation or conjunctival catarrh in five cases. (The question of sinusitis is dealt with later.)

Condition of the Nose.—The bridge of the nose was broad and sunken in twenty cases. Steiner notes that in half of his thirty-four cases the typical facies was present. Only eight of our cases were unilateral, but in these it was noted that on the roomy side of the nose there was dryness and crusting, while on the narrow side fluid purulent discharge was present. The inferior turbinals were atrophied in all but five of our cases; in these latter, however, a marked ozaena odour was noticed. Of Steiner's thirty-four cases thirty-two showed atrophy of the lower turbinals, and only two showed hypertrophy. In thirteen of our cases the middle turbinals were polypoid. Steiner notes that twenty-one of his cases showed

hypertrophied or normal middle turbinals, whereas only eleven showed atrophy. The nasal septum was perforated in fourteen of our syphilitic cases, while a sequestrum was present in only seven instances (the vomer in six cases and middle turbinals in one case). Although the majority of writers agree that the nasal mucous membrane is anæmic in cases of ozaena, there can be no doubt that in many cases, after the removal of the crusts, the mucous membrane is seen to be of a deep red colour; thus Steiner notes that out of his thirty-four cases twenty-two had a pale atrophied mucous membrane, whereas in ten the mucosa was bright red, and in two it was hyperæmic and swollen. The red colour is possibly due to the abnormal transparency of the mucous membrane.

Accessory Sinus Suppuration.—This question was investigated in fifty cases. The antra illuminated well in twenty-nine of these, but in the other twenty-one cases one or both antra were dark. Proof puncture was negative in seventeen of the twenty-one, and positive in only four cases. The frontal sinus illuminated well in all of the fifty cases. In regard to the investigation of the ethmoidal cell labyrinth and the sphenoidal sinuses, it must be remembered that this usually involves the removal of part of the middle turbinal, and, if the result be negative, the condition of the patient has probably not been improved by the operation. The ethmoidal cells and the sphenoidal sinus were, however, investigated in this way in four cases, and in none of these was pus found in the cavities; in one case, however, the mucous membrane of the sphenoidal sinus was seen to be congested and apparently thickened. It is quite possible that this condition also obtained in the maxillary antra in those cases in which transillumination gave a positive result, and yet no pus was washed out on proof puncture. In view of the negative findings in these four cases it was not thought good practice to open up the ethmoidal and sphenoidal sinuses of other patients on the chance of sinus suppuration being present. It will be seen, then, that out of the fifty cases investigated sinus suppuration was determined in only four instances. Steiner notes that five of his thirty-four cases suffered from accessory sinus suppuration.

Purulent Rhinitis (22 Cases).

Under this heading were included cases in which the mucous membrane of the nose was coated with muco-pus or pus. The patients came complaining of nasal discharge and obstruction.

Atrophy of the turbinals was slight or absent, and there were no crusts in the nose. On washing out the nose and removing the purulent secretion the nasal mucous membrane was seen to be red and granular. There were twenty-two cases, eight females and fourteen males. The ages of the patients at the time of observation were as follows: 5 to 9 years, five cases; 10 to 14 years, five cases; 15 to 19 years, five cases; 20 to 24 years, two cases; over 24 years, only two cases.

Causation.—Scarlatina, one; syphilis, one. In the others the cause could not be determined.

Symptoms.—Pain over the eyebrow in one case, pain at the back of the eye, one case; pain in the ear (which was normal), one; frontal pain, one; the sense of smell was lost in four cases but retained in eight (no note in ten cases); epistaxis was present in eight cases. In eight of the patients a marked *ozæna* odour was noted by the observer.

Allied Affections.—Pharyngitis was noted in five, laryngitis in three, and blepharitis in one case.

The Condition of the Nose.—The inferior turbinal was atrophied in three cases, while the middle turbinals were polypoid in two.

Accessory Sinuses.—In only one of the nine cases was accessory sinus suppuration determined.

It will be seen from the analysis of these two conditions that the dividing line between them has been made in a somewhat artificial manner. The presence of crusts and of marked turbinal atrophy were the main determining factors in placing a case in the *ozæna* group.

II. HISTOLOGY.

(Based on the Examination of the Middle Turbinal from Three Cases in which the Ethmoidal Cells were Investigated.)

1. Mrs. H—, aged forty-three, has complained of nasal discharge all her life. Eleven years ago she consulted an oculist on account of pain in the eyes, and was advised to syringe her nose. This treatment resulted in improvement. The patient's sense of smell is not lost. Of late she has complained of headaches. The nose bleeds when she blows it violently. On examination the cornea is opaque on both sides. There is a distinct *ozæna* odour in the patient's breath, and the inferior turbinals are atrophied. Pus is present on the anterior end of the left middle turbinal; on the right side atrophy of the nasal tissue is less marked, and there is a polypus between the middle turbinal and the lateral wall of the nose. The pharynx shows *pharyngitis sicca*, and there is pus on the roof of the *choana* and the posterior ends of the middle turbinals. Illumination: Both frontals illuminate brilliantly; the left antrum lights up fairly well, but the right is dark. Both antra were punctured, the result being positive on the right side and nega-

tive on the left. August 20, 1908: Radical operation on the right antrum. The mucous membrane was congested and slightly thickened: the cavity contained pus. On the left side the middle turbinal was removed, and the ethmoidal labyrinth and sphenoidal sinus opened up, but no pus was evacuated.

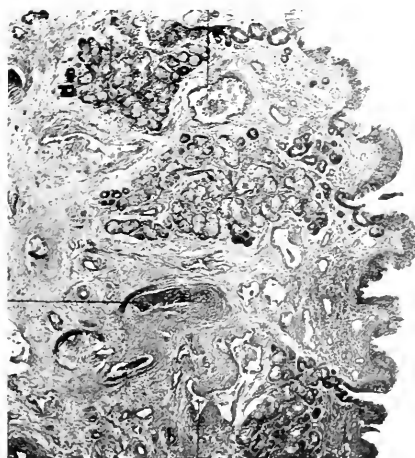
2. M. R—, female, aged twenty-three, has complained of nasal discharge for several years; her nose bleeds occasionally when she blows it. Her friends complain of a bad smell from her nose, and she occasionally notices it herself. She also suffers from headache. On examination the nasal mucosa is dry, the turbinals are small, and the nose contains crusts, dry pus, and blood. The anterior end of the right middle turbinal is enlarged, and the nasal septum is deviated to the left. On posterior rhinoscopy the posterior ends of the inferior turbinals are very small: no pus seen on the roof of the *choanae* or the upper surface of middle turbinals. On illumination, the left antrum and both frontals illuminate well: the right antrum is dark. Proof puncture of the right antrum negative. December 6, 1907: Pus seen in the olfactory cleft, and, by posterior rhinoscopy on the upper surface of both middle turbinals. December 10, 1907: The right middle turbinal removed. December 12, 1907: Right sphenoidal sinus opened and found healthy. January 25, 1908: Patient states that she had severe occipital and vertical pain after the operation, but these have now left her. The patient is using the nose wash, and the nasal mucous membrane is clean and shows no crusts on either side. The inferior turbinals are very small: the patient states that there is no bad smell from her nose now, and that her friends do not complain.

3. I. R—, female, aged eighteen, came to the Royal Infirmary November 12, 1907, complaining of nasal obstruction and of discharge of thick pus and crusts. Her relations state that there is a bad smell from her nose. The patient also complains of deep-seated pain behind the eyes. The sense of smell is lost. On examination the nose is well shaped externally; the right nasal cavity contains a large greyish-green crust: on the left side there is a thick mass of mucus-pus in the middle meatal region. On posterior rhinoscopy mucus-pus is seen on the roof of the *choanae* and posterior ends of the middle and superior turbinals. Illumination: Both frontals illuminate, antra dark, proof puncture negative. November 15, 1907: The nasal membrane carefully observed: pus seen to gather in small areas on the mucous membrane; these areas later become confluent; the ozena odour is very marked to-day. January 3, 1908: Patient admitted to the ward: the right middle turbinal removed under chloroform and the right sphenoidal sinus opened; the lining membrane of sinus seen to be congested, but no pus found in the cavity.

(1) The *superficial epithelium* shows more or less extensive metaplasia from the normal cylindrical ciliated type which is seen in Fig. 1. The surface cells show marked keratinisation, and may be seen peeling off in the form of a small flake (Fig. 2). The metaplasia is most marked along the lower border of the middle turbinal, but extends some distance up the inner and outer surfaces. Higher up still ciliated mucous membrane is present, but here numerous round cells, both polymorphs and mononuclears, may be seen making their way through the superficial epithelium to the surface (Fig. 4). The metaplasia (?) is really a change in the deeper layer of cells; the superficial ciliated epithelial cells are lost over the part which shows squamous epithelium (Fig. 9.) Oppi-

PLATE I.

FIG. 1.



2

Lower border of normal middle turbinal. 1. Slight small cell infiltration of submucosa. 2. Superficial epithelium. 3. Glands. 4. Bone.

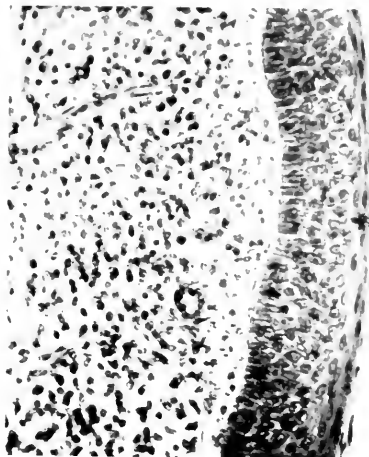
FIG. 2.



1

Lower border of middle turbinal from case of ozena. 1. Horny layer peeling off. Note also dense small cell infiltration of the tissue just beneath the superficial epithelium. $\times 50$. CASE I.

FIG. 3.



1

Lower border of middle turbinal from case of ozena. Shows stratified squamous epithelium with the formation of horny layer on the surface. (2) small cell infiltration in submucosa. $\times 200$. CASE I.

TO ILLUSTRATE MR. J. S. FRASER AND MR. F. ESMOND REYNOLDS'S CONTRIBUTION TO THE QUESTION OF OZENA.

kofer states that in ozaena pavement epithelium is regularly found in the nose, and that extensive stretches of pavement epithelium point to the fact that some serious damaging influence is acting on the mucous membrane. Oppikofer, however, is of opinion that the amount of pavement epithelium is not in proportion to the degree of atrophy of the turbinals, and further remarks that metaplasia may occur apart from ozaena, and that it is not dependent upon suppuration in the accessory cavities. Wingrave states that the basement membrane disappears in ozaena, but in two of our cases it was well marked.

(2) *Changes in the Submucous Tissue.*—There is more or less infiltration of this layer with round-cells, especially marked just beneath the epithelial covering (Fig. 2). Small round-celled infiltration may also be seen around the glands (Figs. 5 and 6) and blood-vessels. Lack found the submucous tissue in cases of ozaena to be thinner and more fibrous than normal, and Holinger compares the shrinkage of this tissue in ozaena to that seen in interstitial nephritis. Réthi states that he found fatty degeneration of the infiltrating cells and fat-droplets in the tissue; he believes that these changes are the essential pathological conditions present in ozaena, but Cholewa and Cordes deny the presence of these changes. As our sections were cut in paraffin we cannot speak as to the presence or absence of fatty degeneration. Small round-celled infiltration of the submucous tissue occurs to a slight extent even in normal turbinals, and may be seen in Fig. 1. It occurs to a more marked degree in chronic hypertrophic conditions, as one of us (J. S. F.), among others, has shown; but, although we speak from the examination of only three cases of ozaena, we have never found anything like the same degree of small-celled infiltration as that shown in Figs. 2, 3, 4, 5, 6, and 8 in normal or merely hypertrophic conditions. The appearances, however, are markedly similar to those seen in the submucous tissue of the nasal accessory sinuses in chronic suppuration, and reported on by one of us (J. S. F.) in a paper published in the JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY, September, 1909. In addition to the small round-celled infiltration, there are seen polymorphs (especially just under the basement membrane), some granular cells, and plasma-cells. At places numerous phagocytes are present, some of these having ingested two or three leucocytes. Figs. 3, 4, and 8 show very clearly the cellular changes. Cordes was the first to call attention to the large number of plasma- or mast-cells in the superficial, and also in the deeper layers of the submucosa; he also found them around

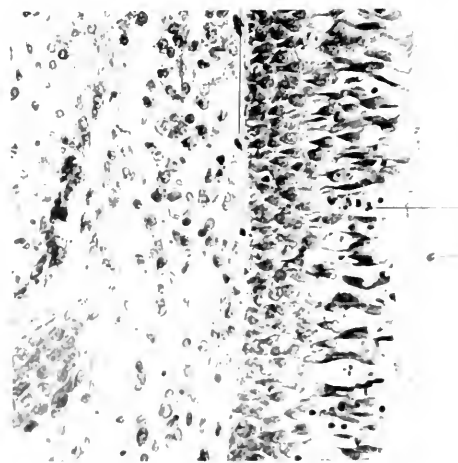
the erectile-tissue spaces, in the periosteum, and in the bone. These cells often present clear spaces, and for this reason Réthi has probably described fatty degeneration of the round-cells. These plasma-cells simply indicate chronic inflammatory change, and may also be found in hypertrophic rhinitis. Besides the cellular infiltration, the submucous tissue shows, in places, new-formed blood-vessels and granulation-tissue formation. In all our cases the inflammatory changes were most marked in the superficial layers of the submucous tissue. Adams also calls attention to the fact that the chronic inflammatory change is most marked towards the periphery of the turbinal, and not towards the bone.

(3) *Changes in the Glands.*—Krause was the first to point out an appearance resembling fatty change in these structures, and Hopmann attributes great importance to this appearance. Hopmann believes that fatty degeneration of the glandular epithelium is essential for the production of ozena, but Cordes and Zuckerkandl have noted this change in other diseases of the nose. We have never noted glandular changes to the same extent as those seen in Figs. 5 and 6 in chronic hypertrophic rhinitis. In Fig. 5, and again in Fig. 6, there is seen at several places mucoid degeneration of the superficial part of the cells lining the gland-duct. It is interesting here to note that a similar appearance is seen in the bronchial mucous membrane in chronic bronchitis. In Fig. 5, towards the right, is seen a gland-duct which has lost all the superficial epithelial cells; similar appearances have been shown by one of us (J. S. F.) in cases of chronic suppuration in the accessory sinuses. The most striking feature, however, in regard to the glands is the marked disappearance of these structures in cases of ozena. Comparison of Fig. 1, which shows the lower border of a normal middle turbinal, with Figs. 2, 5, and 6 will make this clear. In Fig. 1 there is a large number of mucous glands, and the cork-screw ducts lined by normal epithelium may be seen opening on the surface; in Fig. 2 there is an entire absence of glands, while in Figs. 5 and 6 the glands are greatly diminished in number.

(4) *Changes in the Vessels.*—Fraenkel found *endarteritis obliterans* in one case of ozena, and Brouser found thickening of the *adventitia*. In one of our cases marked peri-arteritis is present, together with great thickening of the muscular and adventitial coats of the vessel; the *intima*, however, shows no thickening (Fig. 7). Cordes did not find these changes. In a former paper one of us (J. S. F.) has called attention to the marked thickening

PLATE II.

FIG. 1



Lateral aspect of middle turbinal from case of ozena. 1. Polymorphous cells are seen making their way to the surface through the superficial epithelium, which at this point is of the columnar ciliated variety. 2. Large ciliated variety. 3. Basement membrane. $\times 300$. CASE 1.

FIG. 5.



Lower border of middle turbinal from case of ozena. 1. Dilated gland duct. On the left is seen another gland duct showing the so-called "fatty" (peccary catarrhal) change. Note that the superficial layers of epithelium are peeling off (artificial?). $\times 50$. CASE 3.

FIG. 6.



Lower border of middle turbinal from early case of ozena (hypertrophic stage). 1. The superficial epithelium is almost entirely absent. 2. Dense small-cell infiltration of submucosa. 3. Gland duct showing fatty change (really catarrhal change). 4. Lymph node in submucous tissue. Note also atrophy of glands and blood sinuses. $\times 50$. CASE 2.

PLATE III.

FIG. 7.

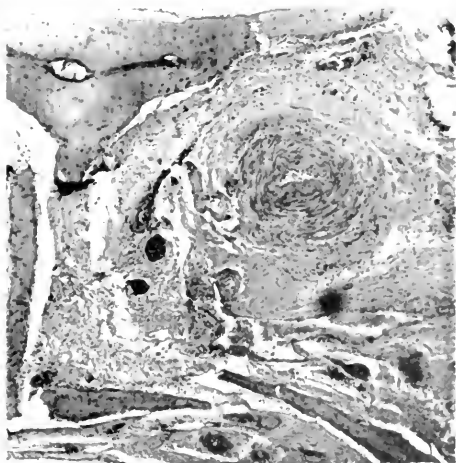
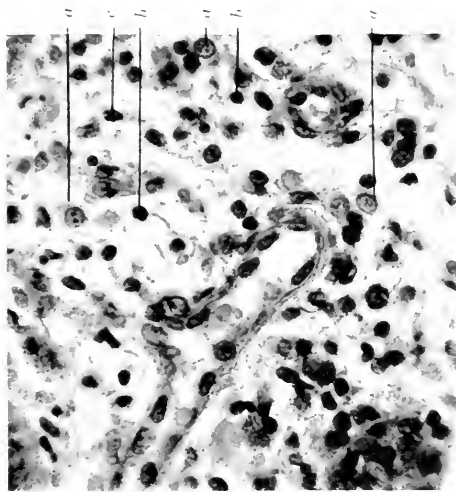


Fig. 7 shows the condition of the bone and periosteum in a case of ozena: the section was cut from a paraffin block and is a little ragged, but the bone appears to be normal. Note the artery, showing marked thickening of the muscular coat and adventitia; the muscular fibres are separated by connective tissue overgrowth. (600 CAS.)

FIG. 8.



a, Large mononuclear cells (phagocytes).
b, Small mononuclear cells (lymphocytes).
c, Connective-tissue cell. $\times 500$.

The photomicrograph shows the nature of the cells which make up the small-cell infiltration.

FIG. 9.



Inner surface of middle turbinal from Case 4b, showing transition from ciliated to squamous epithelium. The superficial ciliated cells are lost, and the squamous epithelium is derived from the deeper layers.

of the vessels to be found in cases of chronic hypertrophic rhinitis and also in accessory sinus suppuration.

(5) *Changes in the Periosteum and Bone.*—Krause found that the margins of the bone were eaten out into bays, and that the edges of these bays show many osteoclasts. Habermann confirms the presence of osteoclasts. According to Krause the periosteum shows new formation of connective-tissue, the subsequent contraction of which is the cause of the rarefaction of the bone. Zuckerkandl found that in early cases the inferior turbinal is thin; later on the bone becomes smaller in length and breadth, while it loses its curvature and tends to become straight. Zuckerkandl believed that these changes were due to a chronic purulent nasal catarrh. Cordes found the margins of the bone hollowed out, and in the excavated parts the periosteum showed very active reproduction and increase in thickness, while around the unchanged bone the periosteum showed small, oval cells with small nuclei. In the bone-marrow Cordes noted the presence of osteoclasts. According to this writer, therefore, the process is one of energetic resorption of bone both on its outer and inner surfaces. In this way the support of the marrow is interfered with. Owing to excessive decalcification of two of our specimens we are unable to give an account of the changes—if any—in the bone and periosteum, but in the remaining case (Fig. 7) we found the bone to be normal, while the periosteum showed only slight thickening and increase of the cellular layer (no osteoclasts). Lack has examined six cases, and states that the bone shows no change. Adams states that the histological examination made in some of his cases shows that the disease does not begin in the bone; in one case in which he resected the septum by the submucous operation he noted that the cartilage was exceedingly thin.

III. BACTERIOLOGY.

Investigations regarding the micro-organisms present in the nasal discharge in cases of ozæna were carried out by E. Fränkel, Löwenberg, Thost, Klamann, Reiman, de Campos Sales, Hajek, Luc, Valentin, Hope, Berliner, Marsano, Besser, Wright, Deletti, Paulsen, and others. Some of these investigators examined merely films of the secretion, and did not study the micro-organisms by cultural methods. Those who used the latter means of investigation described either cocci or bacilli—the bacilli being identified in most cases as Friedländer's pneumo-bacillus. In 1893 Abel

published the results of his very careful and complete researches on seventeen uncomplicated cases of ozena. In sixteen of these he found a bacillus hitherto undescribed, and having, so he maintained, distinctive morphological, cultural, and pathogenic characters. This bacillus—the *Bacillus mucosus ozenæ*—belonged to that group of micro-organisms having for its prototype the pneumo-bacillus of Friedländer. The seventeenth case of his series was one in which crusts had ceased to form, and in which the fœtor had disappeared, and in this case the bacillus was not found. In four out of the sixteen active, untreated cases the bacillus was present in pure culture. In none of the microscopic sections of the mucous membrane made from his series of cases was the *Bacillus mucosus ozenæ* ever found in the deep parts of the tissue. In a further work on the subject Abel found the *Bacillus mucosus ozenæ* present in each of the 100 cases investigated. As a result of his research, and from a consideration of the literature which had appeared up to that time, Abel concluded that the *Bacillus mucosus ozenæ* was probably the cause of ozena, but he ascribed to other micro-organisms the existence of the fœtor so typically met with in the condition. That the *Bacillus mucosus ozenæ*, lying on, or in, the quite superficial parts of the membrane, brings about the changes in the deep parts, he explains by supposing a ferment generated by the bacillus and penetrating deeply into the tissue, supporting his contention by the fact that colour can be produced in the substance of solid media by surface colonies. Abel stated that a strong support for a bacterial origin of ozena was supplied by the fact that the use of antiseptics brings about a true cure of the condition, and does not merely cause the disappearance of the fœtor. That ozena is infective has been shown by the observations of Rosenfeld and Schmuthuisen, the former finding the condition present in twelve members (three generations) of a family, and the latter meeting with it in three sisters. Perez states that by intra-venous injections into animals of the *Bacillus mucosus ozenæ* he has caused disease of the nasal mucous membrane and atrophy of the inferior turbinates. Cozzolino found the *Bacillus mucosus ozenæ* present in all the cases investigated by him, and believes that this organism is responsible for the fœtor. The *Bacillus mucosus ozenæ* was found in thirteen of the twenty cases in which the bacteriology is recorded by Adams.

The individuality of the *Bacillus mucosus ozenæ* was attacked by Frick and Thost, who maintained that it was merely a variety of Friedländer's pneumo-bacillus, and not a distinct micro-orga-

nism. It being realised that the differentiation of the various members of the group of capsulated bacilli (*Bacillus lactis aerogenes*, *Bacillus pneumoniae*, *Bacillus mucosus ozænae*, *Bacillus rhinoscleromatis*) was by no means definite, Russ undertook a research on this class of micro-organisms with a view to determining a certain means of differentiation. He investigated the effects on various of the carbohydrates in regard to acid production and fermentation brought about by each of the members of the group, their action on Endo's lactose-fuchsin-agar, and their action on Loeffler's green solutions. He found that their fermentation and acid-producing properties and their action on Endo's fuchsin-agar gave a distinctive and certain differentiation.

The bacteriology of one of the cases in our series was investigated by Dr. W. T. Ritchie (1909). A pure growth of a bacillus was obtained from the swab from the nose of the patient, and this micro-organism showed the morphological and cultural characteristics of the *Bacillus mucosus ozænae* as given by Abel, and, tested as regards its acid production from carbohydrates, agreed with the findings of Russ.

The bacteriology of a green crust from the nose of a second case in our series was investigated by Dr. T. Shennan (1909). He found staphylococci and a large Gram-negative bacillus, this latter growing only on blood-media. The *Bacillus mucosus ozænae* was not found.

A third case in our series was investigated by one of us (F. E. R., 1909). By aerobic methods a pure culture of a bacillus was obtained from the swab taken from the nose of a patient. This bacillus agreed in its morphological and cultural characters with those of the *Bacillus mucosus ozænae* as given by Abel, and agreed closely as regards acid production from, and fermentation of, carbohydrates, and its action on Endo's lactose-fuchsin-agar as given by Russ for this micro-organism.

In a recently published work, Galli-Valerio was unable to differentiate, by means of the complement fixation test, between the *Bacillus pneumoniae*, the *Bacillus mucosus ozænae*, and the *Bacillus rhinoscleromatis*.

Cholewa and Cordes, in their paper already referred to, consider the question of the *Bacillus mucosus ozænae* being the causal factor of ozæna, and conclude that Abel has by no means proved his contentions. Against his infectious theory of ozæna they quote a family of eight, investigated by them, all of whom, with the exception of the mother, were the subjects of ozæna, and

remark that, if the condition were infectious, surely the mother, above all, would have been attacked. These authors, however, admit that the finding of the *Bacillus mucosus ozenæ* in the nasal secretion is sometimes helpful in making a diagnosis, and think that probably this bacillus has a relationship to crust-formation.

At the present time one is justified in taking up the attitude that the *Bacillus mucosus ozenæ*—a micro-organism distinctive from the other members of the group of capsulated bacilli—is present in the very great majority of cases of ozena, but that, though probably having a certain relationship to a part of the clinical picture presented in ozena, it is by no means the sole causal factor of the symptom-complex.

IV. BRIEF REVIEW OF CHIEF WORK AND MOST IMPORTANT THEORIES IN REGARD TO ÆTIOLOGY AND PATHOLOGY.

The difficulty in classifying the different views as to the ætiology and pathology of ozena is mainly due to the fact that these views are not mutually exclusive. Many writers, whilst holding one theory very strongly, *e. g.* that of primary bone disease, are not prepared to shut out absolutely the possibility of certain other factors, and are inclined to incorporate parts of other theories which fit in with their own views. For this reason we have found it almost impossible to present the different theories as to the pathology of ozena in a clear and definite manner, and must therefore apologise to the reader for the confusion which we have been unable to avoid.

In 1874 B. Fraenkel first described the condition of “*ozena simplex sive catarrhalis*.” He believed that in the first stage of the disease—a stage variable in duration—the secretion was sufficiently fluid to allow of its removal; later, and especially in wide and roomy noses, the secretion dried up, forming the crusts so typical of the disease. He stated that widening of the nasal cavities was often to be observed, especially in noses of the flat and depressed type. Fraenkel suggested that decomposition of the secretion was due to a ferment, and stated that when this change occurred the typical picture of ozena was complete.

(1) *Heredity*.—Treitel has recorded cases of ozena observed in children of 4, 6, and 8 years; the mother of two of them also suffered from ozena, and the father is said to have had a similar complaint. Adams has recorded ten cases belonging to three families: the older members had atrophic rhinitis with ozena,

while the younger had hyperplastic purulent rhinitis, mostly without factor. Parker suggests that cases of ozena occurring in the same family may be due to an inherited roominess of the nasal cavities. The observations of Rosenfeld and Schmithuisen have already been referred to. Lack states that heredity is a marked feature of the disease. Many other writers, notably Hopmann, Alexander, Cholewa, and Cordes lay great stress upon the inherited "tissue weakness" which they claim as the main factor in the production of ozena. The theories of these writers are, however, dealt with later on.

(2) *Contagion*.—Perez regards ozena as a contagious disease. He mentions ninety-eight cases in which infection took place from one member of a family to another, thirty-six cases in which the infection is said to have occurred from someone outside the family, sixteen in which the infection was carried by dogs, and thirty-six where the cause was unknown. Lermoyez believes ozena to be an infectious condition, and states that the organism of ozena, gaining access to the nose, causes a purulent rhinitis which develops into a chronic atrophic rhinitis. This results in sclerosis of the nasal mucous membrane and atrophy; the condition may spread from the nose to other parts. Lermoyez looks upon measles, scarlet fever, inherited syphilis, chronic coryza in infancy, etc., as predisposing factors. Lack has only two cases of contagion amongst 150 cases.

(3) *The Sequel of Chronic Hypertrophic Catarrh*.—Zuckerkandl looked upon ozena as a chronic hypertrophic catarrh of the mucous membrane, which led to atrophy of the bony structures of the lower and sometimes also of the middle turbinal. Even the bony walls of the nose might be involved in the atrophic process. Other writers, and especially Baumgarten, state that there is an early hypertrophic stage of ozena. Adams regards ozena as, in most cases, the end stage of a hyperplastic purulent rhinitis. It is well known that in certain cases of this disease the middle turbinals are polypoid, although the inferior turbinals are atrophic. Out of 150 cases recorded by Lack seventeen had large middle turbinal, while five had polypi. Out of our 138 cases the middle turbinal was polypoid in thirteen cases. In the early stages of purulent rhinitis in childhood Baumgarten and others have found the inferior turbinals to be enlarged. The explanation we suggest of the polypoid condition of the middle turbinals in some cases is that this is merely an early stage of the process. The inferior turbinals have been more severely affected, and have gone on to

atrophy, while the middle turbinals are still at the hypertrophic stage. An analogy can be found in the mucous membrane of the middle ear, which, in acute, subacute, and many cases of chronic suppurative otitis media shows marked thickening, whereas, according to recent views in regard to the pathology of cholesteatoma, the submucous tissue in this condition is extremely thin, and the superficial epithelium has undergone metamorphosis into squamous epithelium.

(4) *Accessory Sinus Suppuration*.—Gruenwald states that he finds sinusitis or some other local source of discharge in every case of ozæna, and, further, that the condition can be cured by treatment of this local affection. In the majority of the twenty-five cases reported by him the suppuration was in the ethmoidal cells. Adams has recorded thirty-one cases of ozæna; sixteen of these had accessory sinus suppuration, the antrum being the cavity most frequently affected. This theory has been investigated by Zuckerkandl, Harke, Minder, and others, and out of a total of twenty-six ozæna cases examined *post-mortem* by these writers, sixteen were found to have accessory sinus disease. In the majority of cases, however, no histological examination of the mucous membrane of the accessory sinus was made, and the presence of muco-purulent fluid in the accessory sinus at autopsy is no evidence of suppuration in these cavities. From the clinical point of view Lack found accessory sinus suppuration in fifteen out of his 150 cases of ozæna (antrum five, sphenoid seven, ethmoid three). Parker, in fifty cases, found antral suppuration three times, sphenoidal suppuration three times, and ethmoidal suppuration twice. Theisen has investigated sixty cases of ozæna, and found fourteen with accessory sinus suppuration; in twelve of these the ethmoidal cells were affected, either alone or in conjunction with other cavities. Réthi found sinusitis twice in sixty-four cases. Loebenberg, however, states that he found accessory sinus disease in all of seventy-nine cases of ozæna (antral twenty-nine, sphenoidal twenty-four, ethmoidal ten, frontal six). As before stated, Steiner found that only five of his thirty-four cases of ozæna showed sinusitis. We only determined accessory sinus suppuration in four out of fifty cases investigated. A grave objection to the "sinusitis" theory of ozæna is the fact that ozæna often commences before the accessory cavities develop. Broechart regards the disease of the accessory cavities as secondary to ozæna. In summing up this theory, we may say that accessory sinus suppuration is seldom accompanied by ozæna, and that many cases of

ozæna—probably the majority—are not complicated by sinusitis. Where accessory sinus suppuration is present in cases of ozæna it is just as likely that the sinusitis is secondary to the ozæna as that the ozæna is due to the sinusitis.

(5) *Tubercle and syphilis*: (A) *Tubercle*.—Cabonche records three cases of ozæna, the first of which was associated with lupus of the nose, and the second with laryngeal and pulmonary tuberculosis. Cholewa states that many patients who suffer from ozæna have a family history of tuberculosis. It will not be disputed that in tuberculosis and lupus of the nasal mucous membrane mixed infection may occur, giving rise to purulent rhinitis. Many of Lack's cases had a family history of tuberculosis, while Alexander found phthisis pulmonalis in twenty-two of his fifty cases. Steiner found that eight out of his thirty-four cases of ozæna had a family history of tuberculosis. In our own series the condition was ascribed to tubercular disease of the nasal mucous membrane in two instances, but a detailed examination of our cases was not made with a view to discovering a family history of tuberculosis or evidence of this disease in other organs. Baumgarten points out that a large proportion of individuals have a family history of tuberculosis or have suffered from this disease in one form or another while, on the other hand, a very large number of ozæna patients show no sign of tuberculosis. (B) *Syphilis*.—Many writers, starting with the premise that the chief causal factor of any infection whose ætiology is shrouded in obscurity must necessarily be a form of lætic infection (acquired or hereditary), have not unnaturally put a like construction upon the ætiology of ozæna. Cholewa states that the sunken nose, so frequently noted in ozæna, is not due to syphilis. According to Lack, however, 6 per cent. of cases of ozæna are due to congenital syphilis, and 4 per cent. to the acquired disease. Steiner states that hereditary syphilis was present in two out of thirty-four cases. In the present series of 138 cases 26 were ascribed on clinical evidence as apparently due to congenital or acquired syphilis. Cholewa states that out of a very large number of patients suffering from ozæna he had never seen one to show signs of hereditary syphilis, and Baumgarten makes a similar statement. In a paper written by one of us (J. S. F.), and published in the JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY in 1909, it was noted that, out of thirty-three cases of congenital syphilis of the ear, eight patients showed sinking of the bridge of the nose, while the nasal septum was perforated in three cases, and in six the patient's breath had the typical

ozæna odour: in only three cases, however, was the characteristic atrophy and crust-formation observed. Sobernheim has examined seventeen ozæna patients by means of the Wassermann reaction, in all cases with negative result. In only two cases, however, were the patients under sixteen years of age, and it is well known that in cases of congenital syphilis the proportion of positive findings by the Wassermann reaction rapidly diminishes after this age. Alexander has examined twenty-six cases by the Wassermann reaction with negative findings; and a similar result was obtained by Eisenlohr in fifteen cases examined.

(6) *Trophic Disturbance*.—Banngarten considers that ozæna is due to trophic disturbance of unknown central origin combined with a congenital predisposition; he believes that unless the disease develops before the tenth year of life an individual will never suffer from it. It is very difficult to deal with a view like this. Although we hold very strongly to the theory that ozæna is an advanced stage of chronic suppurative rhinitis, we may, however, allow that large numbers of children suffer from acute muco-purulent nasal catarrh during attacks of measles, scarlet fever, and coryza, and yet few of them subsequently develop ozæna. It may be that, in cases where it develops into ozæna, there are certain predisposing factors. It seems to us, however, that it would be just as correct to say that innumerable children suffer from acute purulent otitis media during measles or scarlet fever, and yet a comparatively small number of them subsequently develop chronic otorrhœa. Until our knowledge of heredity and immunity is very much greater than at present it is idle to speculate on this subject.

(7) *Abnormal Patency of the Nose*.—Of the two types of face, the chamæprosopic and the leptoprosopic, the former is much more frequently affected by ozæna. In chamæprosopia the nasal fossæ are wide and the septum is short. Meisser notes that among normal people there are 54 per cent. of chamæprosopes and 46 per cent. of leptoprosopes, whereas among cases of ozæna the chamæprosopes number 97.5 per cent. and the leptoprosopes only 2.5 per cent. It must not, however, be forgotten that if the disease begins early in life, as many people believe, it may itself have a marked effect upon the shape of the face. In connection with this question of abnormal patency of the nose given by the face may refer to the somewhat rare cases of unilateral ozæna. The writers have seldom met with a case in which there was well-marked ozæna on one side of the nose and a completely healthy

mucous membrane on the other. They have, however, not infrequently seen cases in which the septum was deviated to one side, and in which the roomy side showed well-marked ozena, while the narrow side showed only the condition of purulent rhinitis, *i.e.* the mucous membrane was congested and covered by a thin layer of muco-purulent or purulent discharge. These cases support the view that ozena is favoured by a roomy condition of the nasal chambers, leading to inefficiency of the act of blowing the nose, and consequent accumulation of the nasal secretion followed by putrefaction. Zaufal was the first to put forward the theory regarding a congenital deficiency or pathological change affecting the inferior turbinates whereby these retain their infantile size, thus leading to widening of the inferior meatus. This anatomical abnormality renders more difficult the expulsion of the secretion, because, as Parker points out, "the same force which causes a swift and forcible current in narrow passages produces a slow and feeble stream in broad channels." Zaufal also maintains that alteration of the air-current through the nose results in the arrest of development of the bridge of the nose, giving rise to the broad, saddle-back type so characteristic of ozena. Zuckerkanhl, however, examined the crania of 252 infants, and in none of these did he find developmental defect of the turbinates. Hopmann, Gerber, and Réthi found that in cases of ozena the septum was unduly short from before backwards, and referred this, together with the atrophy of the turbinates and of the whole facial skeleton, to a hereditary deficiency in development. They thus elaborate Zaufal's contention. Hopmann maintains that this inherited patency is the predisposing factor in the development of ozena. He believes the actual cause of ozena to be an inherited weakness derived from the parents, due especially to tuberculosis, rickets, and syphilis. This inherited "tissue weakness" manifests itself as a poor development of the nasal mucous membrane with consequent diminished power on the part of this structure to withstand disease. At least four causes have been suggested to account for the great increase in the size of the nasal cavities in ozena: *Firstly*, the congenital abnormalities already mentioned; *secondly*, vascular changes, *i.e.* diminished blood-supply due to endo- or peri-arteritis; *thirdly*, atrophy of the connective tissue, or to narrowing of the nasal cavity; *fourthly*, the *toxic* theory: according to this, the atrophy is due to a toxin, which may either come from the surface and saturate the submucous tissue, including the periosteum and bone (Abel), or may be given off from the bone itself;

fourthly, the "collodion film" theory: according to this theory the discharge dries and forms crusts, which exert pressure on the underlying structures in the same way as a collodion film does when painted on a finger or other part. Gruenwald believes the atrophy to be due to the crust-formation. In 1890 Rosenfeld formulated a theory of ozaena whereby he combined the older teaching of Fränkel with that of Zaufal. The alteration in the current of air in the widened nose, the seat of purulent catarrh, caused an imperfect removal of micro-organisms—Rosenfeld paying particular attention to micrococci. He thought that these micro-organisms, through elaboration of a ferment, brought about decomposition of the secretion. Our own position in regard to this matter is as follows: We believe that, other things being equal, there is more tendency for a congenitally roomy nose to become the seat of ozaena, because, in such cases, there is a greater tendency to retention of the secretion on account of the insufficiency of the act of blowing the nose; there is also a greater tendency to drying of the secretion on account of the diminished humidity of the air in such a nasal cavity. The stagnation of the secretion thus brought about results in secondary putrefactive changes—in other words, in "ozaena" or "bad smell." Cases of unilateral ozaena, where the roomy side alone shows crusts, seems to us to afford the best proof of the truth of this opinion.

(5) *Bony disease*.—Hopmann considers that, in addition to the faulty development of the nasal mucous membrane due to "tissue weakness," there is also maldevelopment of the bones of the nose. This manifests itself in early life either as an osteoporotic or as an osteo-sclerotic process. In the former condition the rarefying osteitis may persist for a considerable time—the bones remaining weak and prone to fracture. The bony skeleton of the whole nose suffers, and widening of the nose, of the choanae, and of the accessory sinuses results. If, now, a purulent condition arises in the nose, crusts and fætor are the result: such a condition is very likely to occur, as the resistance of the mucous membrane to disease is greatly lowered. Hopmann states that these pre-natal disturbances of the development affect especially the spheno-occipital synchondrosis. Mal-developments of the sphenoid and its pterygoid processes and also of the ethmoid result, these bones keeping their child-like proportions. Keyser investigated this subject by measuring from the margin of the scalp to the point of the chin, and found that in the great majority of ozaena patients a marked chamaeprosopia was present. This was confirmed by Siebenmann

and Meisser. Siebenmann also found that the vomer was shorter from before backwards, and that chamaeprosopia was present in thirty-nine out of forty cases of ozaena. Minder, on the other hand, found leptoprosopia present in three out of five cases of ozaena, while in one only did he find chamaeprosopia.

In their valuable paper Cholewa and Cordes insist that ozaena must be looked upon not merely as a disease of the mucous membrane, but as essentially a disease of the bones forming the whole nasal skeleton. They regard the changes in the mucosa and in the glands as secondary to the primary process in the bones. From a microscopical examination of four cases they held that there was a marked disproportion between the processes of bony resorption and apposition, greatly to the disadvantage of the latter. As a result of this the marrow tissue loses its support, and there is great disturbance of the circulation and consequently of the nourishment of the nasal tissues. They believe that the condition is not inflammatory, and that the evidence of inflammatory reaction seen in the secretions is due to the changes in the mucous membrane. In their general conclusions the authors draw an analogy between ozaena and osteo-malacia. They regard the changes in the mucous membranes as probably the result of the altered conditions in the blood-supply due to changes in the marrow, and not to disease of the coats of the vessels (Fraenkel) or to connective-tissue changes (Zarniko). Owing to the diminished blood-supply the erectile tissue is affected, and the authors find evidence of weakness in its muscular development. This they regard as a weighty factor in the further changes in the mucous membrane. They maintain that crust-formation is due, not merely to the wide nasal cavities, but also to the altered secretion of the mucous membrane as evidenced by the discharge being strongly alkaline instead of neutral or weakly alkaline as in normal conditions. This alteration in the glandular secretion, they think, is due to the fact that the glands are surrounded by stagnant, and therefore richly venous, blood. Loss of nervous sensibility in the nose—a condition frequently marked in cases of ozaena—probably plays a part in the formation of crusts. They, however, attribute importance to the presence of pus, and acknowledge that crust-formation does not occur if pus be absent. They think that Abel's *Bacillus mucosus ozaenae* is an important factor in the production of the pus. In conclusion, they look upon the actual causal factor of ozaena—like that of osteomalacia—as unknown, though they suggest that both conditions are of the nature of tropho-

neurosis (see 6). In a recent important paper Alexander associates himself with the "bone disease" theory of the causation of ozaena; he believes that "ohne Knochenkrankung keine Ozaena." Alexander considers that ozaena is inherited, but that it is not congenital. It may appear any time during the first thirty years of life, but usually during infancy. Alexander's theory may be stated as follows: An individual with a liability to metabolic changes in certain bones, and especially those of the face, inherits a toxin which manifests itself either at the physiological puberty or else at such time as the resistive power is lowered by pathological processes of the nature of infectious disease. The effect of the toxin is to cause pathological disturbances in the nourishment of the bone, and this is the foundation of all the changes associated with ozaena. The bone-cells lose their power of replacing to a sufficient degree discarded bony material. If this come about (*a*) during fetal or early uterine life there results a saddle-nose of the hyperplatyrhinc type, together with arrest of development and atrophy of the bones of the face. (*b*) If the condition first manifests itself during the period of growth of the bones there comes about a more or less broad, flattened, nasal bridge, with transformation of the form of the face in the direction of chamaeprosopia, and atrophy of the bones of the face. (*c*) If the process begins after completion of bony growth the form of the face and nose remains unchanged. Further, the bone-cells give off pathological products owing to their disordered metabolism, and these products mix with the tissue fluid affecting the surface mucous membrane and causing its atrophy. The muscular coats of the erectile tissue participate in the atrophy, and collapse of the erectile tissue results. Anæmia of the mucous membrane is due to the involvement of the capillaries in the disease process. Alexander agrees with Cholewa and Cordes as to the semi-stagnant and richly venous blood-supply of the mucous membrane. He attributes the widening of the nasal cavities to the atrophy of the bony structures and of the soft parts, as explained above, and also considers that the altered tissue fluids exercise a strong irritant action on the mucous membrane and lead to purulent secretion. Interference with nutrition accounts for the alteration in the glands and the metaplasia of the superficial epithelium. Only a small amount of mucus is secreted by the glands, its place being taken by a fatty substance. Alexander traces further changes as due to the pathological products given off by the bone-cells: thus the skin and subcutaneous tissue have a doughy consistence where they lie over the diseased

bones. Absorption of the altered tissue fluid leads to atrophy of the submaxillary glands, of the deep cervical glands, and, indeed, of the whole lymph apparatus of the posterior and lateral wall of the pharynx. The pathological products may also give rise to *ozæna pharyngis et laryngis*. Alexander holds that crust-formation is due to the mechanical difficulty experienced in getting rid of the secretion from the wide nose, and also to increased evaporation of the fluid part; it is, moreover, greatly favoured by the change in the character of the secretion indicated above. Factor is due to the decomposition of the secretion by secondary bacterial infection.

In criticising the "bone disease" theory of *ozæna* we wish to point out that, in the present state of our knowledge of heredity, it seems rather premature to postulate an inherited weakness of certain cranial and facial bones. The purulent inflammation of the nasal mucous membrane in *ozæna* is almost universally acknowledged, but the supporters of the "bone disease" theory have not proved that bony changes precede those in the mucosa. The presence of bone disease is denied by Lack in the five cases examined by him, and the present writers can support his observations, at least in regard to one of their three cases (in the other two the bone was over-decalcified). Many children suffer at one time or another from purulent rhinitis, and the writers are of opinion that in those cases which develop into *ozæna* a lowered condition of the general health and want of proper treatment are just as probable (if not more probable) causes of the change as "inherited tissue weakness."

(9) *Chronic Purulent Rhinitis*.—Amongst English and American writers Bosworth is usually credited with originating the theory that *ozæna* is merely the late stage of purulent rhinitis. As has already been shown, numerous observers call attention to the fact that most cases of *ozæna* date from early childhood. Macdonald states that a large majority of *ozæna* patients are children and young adults, and that the affection usually dates from an attack of measles, scarlet fever, coryza, etc., which sets up muco-purulent or purulent rhinitis. Parker mentions typhoid fever, smallpox, influenza, diphtheria, foreign bodies, and maternal gonorrhœa as causes of purulent rhinitis. To this list we may add intra-nasal operations, especially inferior turbinectomy. It is almost impossible in this operation to obviate altogether the risk of septic infection, and, further, we must remember that the patient has in some cases been provided with a too roomy nose. The risk of such a condition arising was, of course, much greater in the days of the

spokeshave. In regard to the list of diseases given by Bosworth, Macdonald, Parker, and others as predisposing to ozæna, we should like to call attention to the fact that these conditions are very much the same as those which give rise to chronic suppurative otitis media. While Lack and Parker favour the "purulent rhinitis" theory of the causation of ozæna, the latter calls attention to the fact that all cases of purulent rhinitis in childhood do not go on to ozæna, and he further acknowledges that another factor must be present, a factor he finds in abnormal patency of the nasal cavities. One objection to the "purulent rhinitis" theory is the fact that ozæna is much less common than one might expect. There are two replies to this objection: (1) Purulent rhinitis is probably more common than is usually supposed. There are many cases with a slight amount of pus and crust-formation in the nose which are really mild cases of ozæna in all essentials. We have recorded twenty-two of these cases at the beginning of this article. (2) The nasal cavities are better drained, and the nasal mucous membrane is more vascular than those of the accessory sinuses and middle-ear cleft. There is thus a greater likelihood of natural cure in a case of suppurative catarrh in the nose than in the accessory cavities or middle-ear cleft. We may well ask the question, "Where is chronic purulent rhinitis if it is not represented by ozæna?" We know chronic purulent disease of the accessory sinuses, of the middle-ear cleft, and also chronic purulent bronchitis and bronchiectasis, but we have no generally acknowledged representative among the diseases of the nasal mucous membrane proper of this particular affection. Another point in favour of the analogy we are trying to draw is the fact that ozæna occurs mainly among the poorer classes. In a recent paper Baumgarten has traced the stages in the development of ozæna from purulent rhinitis in infancy. The three cases recorded were first seen in infancy, and at this time Baumgarten removed crusts and dried secretion from the nasal chambers. About the third year Baumgarten noticed in these cases that one inferior turbinal was swollen and congested, while at the same time the other was contracted; this condition alternated in the two nostrils. At the same time he noticed a tendency to drying of the secretion on the inferior turbinal and posterior part of the inferior meatus. He again examined the cases from the fifth to the seventh years and found the typical ozæna condition fully developed. It would be a great advantage if other observers would thus follow up their cases of purulent rhinitis in childhood. In regard to the period at

which purulent rhinitis passes into ozæna, Parker is of opinion that puberty is the commonest age for this change to occur, and states as his reason that at puberty the upper respiratory tract undergoes rapid development out of proportion to the growth of the rest of the body. This greatly increases the size of the nasal cavities. He further remarks that in females this period is often associated with ill-health and anemia. Doebeli's observations certainly support the "purulent rhinitis" theory. After thoroughly cleansing the nose in seven cases this observer watched the formation of crusts from hour to hour, and controlled his observations by the use of the microscope. He found that in all cases leucocytes formed the greater part of the discharge. He also saw a few plasma-cells and some squamous epithelium; these latter cells were at first rare, but later on became numerous. Macroscopically, a thin layer of mucoid discharge was first observed; this increased in amount and went on to form a white patch, which later on became a white membrane. Watson Williams is of opinion that ozæna is a chronic inflammatory degeneration of the nasal mucous membrane due to infection by various organisms. He adds, however, that in some cases it may partake of the nature of a trophoneurosis. Our contention is that, in the early stages of ozæna—*i.e.* in the stage of acute and subacute purulent rhinitis—the mucous membrane is moist, red, and swollen, as in cases of suppuration in the accessory sinuses and middle ear. In these latter conditions (suppurative otitis and sinusitis) microscopic examination shows vascular engorgement, slight œdema, and marked small-celled infiltration of the submucous tissue, and, in places, desquamation of the superficial epithelium. In advanced cases, on the other hand, there is in all three conditions (cholesteatoma, sinusitis, and ozæna) a change in the superficial epithelium. The cubical or cylindrical cells cease to re-form, and are replaced by the squamous type. In this connection Ivy McKenzie points out that the nose, middle-ear cleft, and also the bronchial tubes are lined by epithelium of epiblastic origin. Wingrave believes that the squamous epithelium in cases of cholesteatoma is due to a metaplasia of the tympanic epithelium, and not to an ingrowth of epidermis from the meatus; he goes on, however, to say that in his opinion cholesteatoma is due to the drying effect of the air which gains access through the perforation. This seems to us a very incomplete explanation of the process, as many cases of chronic suppurative otitis media go on for years without cholesteatoma formation, even although there may be a large per-

foration. The explanation is probably to be found in the nature of the mixed infection. One of us (F. E. R.), in conjunction with Dr. Logan Turner, has shown that in cholesteatoma the *Bacillus proteus* is frequently present in addition to other pyogenic organisms. In ozaena we have the *Bacillus mucosus ozaenæ*, and, in addition, other micro-organisms. One of us (J. S. F.), following Oppikofer, has shown that in chronic suppurative sinusitis the superficial layer of the mucous membrane reverts in some cases to the squamous type, but, as yet, it has not been possible to associate this with any particular type of mixed infection. Dr. James Ritchie, of the Royal College of Physicians' Laboratory, Edinburgh, informs us that in chronic bronchitis and bronchiectasis a change is, in some cases, observed in the superficial epithelium lining the bronchial tubes: in many chronic cases the epithelium becomes cuboidal or irregular, and, in advanced cases, it distinctly reverts to the squamous type. It may be objected to the analogy we have attempted to draw that in sinusitis and suppurative otitis media there are no crusts, but we must remember that in the nose the drying effect of the air-current is great, whereas in the middle ear, even in cases of large perforation, the drying effect of the air in the tympanic cavity and antrum can be very slight indeed, while in the accessory sinuses in cases of chronic suppuration there is no access of air sufficient to cause drying of the secretion. If the comparison of ozaena with cholesteatoma and bronchiectasis be further considered, it will be remembered that we have in all three cases a purulent inflammation of the mucous membrane and an atrophy of the underlying structures—nasal turbinates in ozaena, bony walls of the middle ear in cholesteatoma, and the skeleton of the bronchial tubes in bronchiectasis. As before stated, several factors may possibly act together in bringing about this change. Toxic influence is probably the most important, though the effects of pressure and vascular changes cannot be omitted. Ewart states that in the later stages of bronchiectasis the bronchial mucosa loses its velvety look and assumes a smooth and shining appearance. McKenzie has found epithelial metaplasia in the bronchial lining membrane in cases of bronchiectasis: he is of opinion that bronchiectasis is due to the destruction of the bronchial wall and especially of the elastic tissue by the suppurative process; the wall, weakened in this way, is unable to withstand the intra-bronchial pressure.

V. CONCLUSIONS.

In our opinion the following conclusions may be drawn from the analysis of the literature of the subject, including the aetiology, histology, bacteriology, and symptomatology of the disease, and from our own observations: (1) No clear line of demarcation can be drawn between chronic purulent rhinitis and ozaena. (2) Chronic purulent rhinitis (ozaena) usually begins early in life as a hypertrophic catarrh of the nasal mucous membrane; the inferior turbinal is most severely affected, and has frequently gone on to atrophy while the middle turbinal is still in the hypertrophic stage. (3) The most common causes are the exanthemata, coryza in infants, and syphilis. (4) Chronic purulent rhinitis leads to various changes in the nasal mucosa, notably metaplasia of large areas of the superficial ciliated epithelium into squamous epithelium; dense small-celled infiltration of the submucous tissue (most marked in the superficial layers); catarrhal changes in, and atrophy of, the mucous glands; diminution in size and number of the cavernous blood-spaces. In many cases there is atrophy of the turbinal bones, especially of the inferior turbinal. In some cases there is arterial disease, and in the majority of cases there is sclerosis of the deeper layers of the submucous tissue. These changes have their counterparts in the mucous membrane of the accessory sinuses in certain cases of chronic suppuration, in the middle-ear cleft in certain cases of chronic suppurative otitis media with cholesteatoma formation, and in the bronchi in such conditions as chronic purulent bronchitis and bronchiectasis. (5) Various micro-organisms give rise to the first stage of ozaena, *i. e.* to acute and subacute purulent rhinitis—*Micrococcus catarrhalis*, *Pneumococcus*, staphylococci, and streptococci, etc. The characteristic picture of ozaena is probably only produced when the *Bacillus mucosus ozaenae* is present. (6) Ozaena is more likely to develop in a congenitally roomy nose than in a narrow one on account of the greater tendency in the former to stagnation and consequent putrefaction of the secretions. (7) Atrophy of the nasal tissues may be due to the pressure of the crusts and to vascular or sclerotic changes, but is probably mainly due to toxic influences. (8) Tubercle and syphilis are concerned in the production of ozaena, in that they may lead to chronic purulent rhinitis. (9) Accessory sinus suppuration is not the cause of ozaena, though it not infrequently complicates this condition. (10) It is clearly established that ozaena not infrequently occurs in several members of the same

family, and there are some grounds for regarding it as a contagious disease. (11) Those who support the "primary bone disease" theory in regard to the causation of ozena have not shown that changes in the bone precede those in the mucous membrane; a lowered state of general health and neglect of treatment have probably more to do with the transition of purulent rhinitis into ozena than "congenital tissue weakness."

We hope on a future occasion to give an account of the various methods of treating ozena, and of the results obtained, and to include our own experiences in this matter. In conclusion, we would like to express our gratitude to Dr. Logan Turner for the opportunities we have had for clinical, histological, and bacteriological work. We would also like to thank Dr. Sheman and other members of the staff of the Pathological Department of the Royal Infirmary for their assistance in regard to the histological and bacteriological work. Finally, one of us (J. S. F.) desires to record his indebtedness to the authorities of the Royal College of Physicians' Laboratory, Edinburgh, and to the Carnegie Trust.

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SOCIETIES' PROCEEDINGS.

ROYAL SOCIETY OF MEDICINE—OTOLOGICAL SECTION.

February 17, 1911.

MR. A. H. CHEATLE, *President, in the Chair.*

(Abstract Report.)

REPORT ON THE FATAL TERMINATION OF CASE OF DEAFNESS AND DISCOMFORT IN THE RIGHT EAR¹ AS EARLY SYMPTOMS IN A CASE OF EPITHELIOMA ORIGINATING NEAR THE RIGHT EUSTACHIAN TUBE.

BY EDWARD LAW, M.D.

MR. WILFRED TROTTER supplied microscopic specimens and the following notes :

1909: June 4.—Tumour of naso-pharynx removed after an osteoplastic resection of the maxilla.

1910: January 13.—Patient complained of considerable pain, mainly in the second division of the fifth nerve, but there was no other sign to suggest a recurrence. The patient attended hospital regularly until August, the pain getting gradually worse and worse, but with no sign of local recurrence in the naso-pharynx. In August he was admitted into University College Hospital and injections of alcohol were made into the second and third divisions of the fifth nerve without any relief. On September 28 Mr. Trotter removed the infra-orbital nerve from its canal, but the pain still persisted. On October 11 Mr. Trotter explored the Gasserian ganglion and found it involved in a recurrence of the growth. The bone below it was soft, and an exact location of the ganglion was not easy. The patient recovered from the operation, and the relief from pain proved that the ganglion had been removed.

¹ Brought before this Section on February 5, 1910; see JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY, March, 1910, p. 141.

Dr. D. R. PATERSON asked whether Mr. Trotter could state the degree of success he had had in the operation for this condition. He had now under observation a woman, aged seventy, and wondered whether that was too great an age to stand the shock of such a procedure. The lesion was around the Eustachian tube, on the right side, and the symptoms were practically the same as in Dr. Law's case.

Mr. HERBERT TILLEY said he had the opportunity of seeing the case with Dr. Law and Mr. Trotter before the operation, and since that time he had seen three other cases. When this case was discussed last year he said he thought the disease was not so rare in that situation as many considered, as he had then seen four cases. In each of those cases a prominent symptom had been some nasal obstruction on one side, associated with deafness, but the chief feature had been the intense pain. His fourth patient sought relief because of excruciating pain, for which he had been having injections of morphia, etc., and there were so many involved glands in the neck that operation was considered inadvisable. The three suggestive diagnostic symptoms were, therefore, nasal obstruction, deafness, and intense pain. Three of the cases had anaesthesia on the right side of the mandible. All his cases had been males, and the affection in three of them was on the right side.

Mr. WILFRED TROTTER said there were three points which he wished to mention particularly. He had now operated upon eight cases of infiltrating malignant tumour on the lateral wall of the naso-pharynx, and it was upon those cases he founded his conclusions. Five or six cases of the eight followed a clinical picture which was extraordinarily precise. The first symptom was usually pain, which was typical trigeminal pain, localised to the anatomical distribution of the nerve, usually beginning in the third division, spreading to the second division, but practically never involving the first. During the earlier months of the disease there was no other physical sign, except, perhaps, anaesthesia, partial or complete, on the chin, due to the involvement of the inferior dental nerve. The second symptom was deafness, of Eustachian tube character, which might be relieved by the passage of an Eustachian catheter. There was a difficulty in the passage of the catheter in the present case, and it was that which forcibly drew attention to the naso-pharynx. The third symptom was some abnormality in the soft palate on the same side, not due to involvement of the nerve supply of the palate, but to implication of the levator palati muscle. Therefore the first defect was in connection with lowering, not raising, the palate on that side, because the muscle was so infiltrated by the growth that it could not be relaxed. The palate was seen to be asymmetrical, and one was inclined to think there must be some weakness, but the patient could be seen to raise the palate well. After a time some oedema was seen on that side. The sequence of events was characteristic, and was due to the fact that the growth was developing in a very small region, the Eustachian tube, the inferior division of the fifth nerve, and the levator palati muscle all being within $\frac{3}{4}$ in. of each other, so that a lesion as large as a shilling could involve all those structures. Nasal obstruction was not always present, and might not be complete. In four out of his eight cases that side of the nose was comparatively free. The tumour was not essentially one of the mucous membrane, but probably originated outside it; therefore its projection into the pharynx might be but slight. He exhibited the specimen of a tumour which he removed the previous day; it showed the growth surrounding the Eustachian tube, but not occluding it. So it would have been possible to have passed a Eustachian catheter and to have been none the

wiser as to the condition present. The diagnosis could only be made by digital examination of the naso-pharynx, but much projection into that cavity was not necessarily present. In Dr. Law's case the tumour had a pedunculated projection, but in the other cases he could find only a flat, hard mass in the lateral wall of the naso-pharynx. He had no experience of treatment of the condition other than by removal. He had not seen a case which had remained free from recurrence for more than fifteen months; but all the cases he had seen had come for treatment comparatively late; there had generally been neuralgic pain for months before the condition was recognised, and there might be no other obvious signs. If the source of the symptoms were recognised and the operative treatment undertaken earlier, there might be an opportunity of getting satisfactory results. The only way to remove the tumour was to do an osteoplastic resection of the upper jaw; this gave admirable access and there would be no deformity following. In regard to resecting the upper jaw, it was better instead of the classical operation to include the malar bone with the maxilla and not divide the malar process of the upper jaw, but divide the malar bone in the external angular process and the zygoma. That gave perfect access to the base of the skull and pterygoid region. It was necessary to remove the whole internal pterygoid muscle, certainly the third division of the fifth nerve, and possibly also the second division, with some of the muscles on the front of the spine. It might be necessary to divide the internal carotid. He had done that in two cases, and had had to ligature the artery in the neck, but the patients seemed none the worse. It was generally necessary to remove the glands of the neck, because those tumours frequently invaded the lymphatics. The tumour in this case was an endothelioma, not epithelioma; and that was a point which perhaps made the cases more favourable for operation, because such endotheliomata were usually of slow growth. In answer to the President, he said this patient (Dr. Law's case) died because the disease ultimately involved the brain through the foramina of the base of the skull. There was a persistence of trigeminal pain, and he removed the Gasserian ganglion to relieve it; but the symptoms of cerebral tumour supervened, and death was due to infiltration of the base of the brain.

CARIES AND NECROSIS OF TEMPORAL, PARIETAL, AND OCCIPITAL BONES FOLLOWING MASTOIDITIS DUE TO SCARLET FEVER IN A GIRL, AGED FIVE; OPERATION; RECOVERY.

By H. J. DAVIS, M.B.

An operation had been performed some months previous to his seeing the child, presumably to drain the mastoid antrum. This had not been reached, but the dura mater in the middle fossa exposed instead; pus tracked between the dura mater and the bone, perforated the occipital, and presented as an occipital abscess. This was opened and the dura mater over these areas denuded of bone; a radical mastoid was done at the same time. Two plastic operations were necessary later, to cover an extensive wound. The child was very ill, but was well now. There was still occasional discharge from the ear.

The PRESIDENT (MR. ARTHUR H. CHEATLE) asked where the parietal bone was affected in this case. He would also be glad to know why the radical operation was done. It was an acute case, and there seemed to be an increasing tendency to do the radical operation immediately if

an acute case did not soon do well. He disapproved of this tendency, as the desire should be to save the middle ear as much as possible.

Mr. WEST asked what was the area of necrosis.

Dr. DAN McKENZIE asked if the responsible organism was found, and if so, what it was.

Dr. URBAN PRITCHARD asked whether, in this case, the failure to reach the antrum was due to working too far back, or to not having worked deeply enough. Some surgeons in former days used to go too far back, so that they did not enter the antrum.

Dr. DAVIS, in reply, said he saw the case a considerable time after it left the Fever Hospital, and he gathered that the child had had acute inflammation of the mastoid, and there was a discharge from a sinus behind the ear, much further back than the antrum. The middle ear was full of granulations and pus, and merely opening the mastoid behind would not have been of much use. That was why the radical operation was done. He supposed the middle fossa had been opened and mistaken for the antrum, consequently the pus had tracked down under the bone posteriorly to the occiput. When the abscess was incised there was a small hole leading into the occipital bone, and in this was a large gutter, which had to be chipped away. The child was ill for a long time, and much of the skin had to be removed. He did not know what the organisms found were.

EXTRA-DURAL CEREBELLAR ABSCESS TRACKING THROUGH THE JUGULAR FORAMEN INTO THE NECK.¹

By H. J. DAVIS, M.B.

The patient was a girl, aged nineteen. It could be noticed that the right pupil still remained dilated from irritation of the sympathetic. The mastoid process had been entirely removed, but there was no facial paralysis. The internal jugular vein, the middle third of which had sloughed, had been ligatured at the level of the clavicle.

ACUTE VERTIGO, WITH REPEATED FALLS ALWAYS TO THE LEFT, DURING THE LAST TWO MONTHS.

By H. J. DAVIS, M.B.

The patient, a parlourmaid, aged twenty-one, was admitted into hospital on December 2, 1910, with violent nystagmus, giddiness, and tinnitus. Otorrhœa left ear on and off for years; the mastoid and left side of the head were so tender that she could not tolerate the slightest touch; no optic neuritis, no sickness. Next day the antrum was opened; the bone was of the infantile type; no fistula or erosion into either fossa detected, and nothing further was done. The post-aural wound was left open with a view to a possible extensive operation being necessary.

The vertigo was not in any way relieved by drainage, and the tinnitus was so distracting that she used to scream and knock her head against the wall, and was so troublesome in many ways that relief for herself and others was only obtained by hypodermic injections of morphia.

When out of bed she would fall to the ground quite suddenly, but always to the left; she had three fits, epileptiform in character, but not

¹ The case was reported to the Section on November 18, 1910, see JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY, December, 1910, p. 644.

(?) epileptic, and she refused food for a whole week: headache was constant, and vertigo periodical and violent. Mr. Armour saw her, and advised against any further operation, and Dr. Grainger Stewart, who has examined her several times, stated "that he could find no evidence of organic disease of the nervous system, of auditory tumour, or cerebellar disease." She improved, and left the wards a fortnight ago. Briefly, her present condition was as follows:

(1) Complete anaesthesia of the left half of the body, eye, nasal mucosa, tongue, lips, ear, and larynx.

(2) She heard nothing on the left side, and felt nothing even when a probe was passed into the meatus.

(3) Syringing with hot and ice-cold water produced no reaction whatever in the labyrinth—she did not even feel that this was being done.

(4) The tongue could not be protruded straight, but deviated to either side.

The case was a complicated one, and it was a question whether the real nature of the disease was labyrinthine, intra-cranial, or due to hysteria; there was no doubt that the patient was neurotic, but had she an organic lesion as well?

Dr. DAVIS added that the vertigo was most violent; the patient's bed seemed to her suddenly to spin round counter-clockwise, and she had the sensation of falling down into the ward below. She had become completely anaesthetic on the left side, and since the last twenty-four hours on the right. She had heard nothing during the last five days. He had syringed the right ear the day before with cold water to see if there was any reaction. After two minutes she fell over on the right side. One could syringe the left ear without the patient knowing it was being done.

Mr. WEST asked what was the character of the nystagmus.

Dr. DAN McKENZIE said that, looking at the case from the point of view of the vestibular reactions, it was interesting, as he had shown one or two cases before the Section in which, in hysteria, the vestibular reactions were active. Some of the features of the present case were very suspicious indeed of hysteria, the hemianaesthesia, and the subsequent occurrence of anaesthesia on the right side, involving the whole of the cutaneous surface. So that, unless subsequent developments justified a different view, he thought it might be taken to be a case of hysteria in which vestibular reactions were absent.

Dr. PRITCHARD said one would, *à priori*, conclude it to be a case of hysteria. He asked whether the retina was examined, and, if so, whether the field of vision was contracted, as that was said to be an accompaniment of hysteria.

The PRESIDENT raised the question as to whether it might be organic ear trouble, with a neurosis which would account for the remainder of the symptoms. He did not regard spontaneous nystagmus as hysterical. Had any search and inquiry been made to ascertain whether there was congenital syphilis?

Mr. SYDNEY SCOTT said he considered that the case was not hysteria alone, but that there must be some organic lesion to account for the absence of vestibular reactions on one side.

Dr. DAVIS replied that the case at first appeared to be one of acute suppurative labyrinthitis; but it could not have been that as the ear would not have dried up as it had done. Her vertigo was very violent, and two attempts made by the ophthalmic surgeon to examine her eyes were not very successful, as she became so giddy on opening her eyes that

her fields of vision could not be taken. He did not think it could be pure hysteria, but that there must be some intra-cranial trouble as well. Wassermann reaction proved negative. He did not think it was possible for a patient to be in such a condition unless there was something organic the matter with the nervous system. It had been suggested that she was insane, but that was not his (Dr. Davis's) view; her memory was good, and she knew that what she was doing was unreasonable. Mercury and iodide had no effect, but full doses of hydrobromic acid relieved the vertigo. Vertigo due to labyrinthine involvement was violent at first but tended slowly to pass off, whereas vertigo due to an intra-cranial lesion persisted. This might be the case with hysteria, too.

FISTULA OF THE AMPULLA OF THE SUPERIOR SEMI-CIRCULAR CANAL ON THE LEFT SIDE; BILATERAL RADICAL MASTOID OPERATION; INSTRUMENTAL EXPLORATION OF THE LEFT VESTIBULE; TOTAL VESTIBULAR ABLATION-REACTIONS (LEFT SIDE); COCHLEA UNAFFECTED.

BY SYDNEY SCOTT, M.S.

C. O. —, a carpenter, aged thirty-five; admitted to hospital on July 21, 1910.

History.—Bilateral otorrhoea following scarlet fever in childhood. Intermittent for previous two years. November, 1909, laid up in bed for five weeks with vertigo and vomiting, provoked by the slightest movement of the head. Returned to work June, 1910. Earache on the left side was followed by facial paresis, early in July.

Otoscopic Appearances.—The meatus on each side contained pus and epithelial debris; large defects in tympanic membranes; landmarks obscured.

Hearing Tests.—Left ear: Conversational voice between 1 and 2 metres. Rinne negative. Schwabach doubtfully negative (hypersensitiveness of the mastoid, which prevented usual pressure of fork). Low limit not recorded before operation. High limit of tone range, 12,000 (Edelmann). Right ear: Conversational voice not heard quite as well in the right as in the left ear. (Tested with meatus closed and with Bárány's Lärm Apparat in opposite meatus.) Low limit of tone range, 26 d.v. (Bezold's fork). High limit, 12,000 (Edelmann).

No spontaneous nystagmus or forced movements. No Rombergism. Caloric tests applied to left ear only (before operation). Cold (60° F.). No nystagmus in erect position; no horizontal nystagmus when lying face upwards, and slight dizziness when seated upright, after irrigating for over five minutes. No meatal air-compression reaction.

Radical Mastoid Operation (left side), July 23, 1910.—Granulations and cholesteatoma. Dense mastoid cortex. Fistula of ampulla of superior canal about 1½ mm. in diameter. This admitted a seeker, which entered a cavity corresponding to the vestibule, above the facial nerve and in front of ampulla of the external canal. Malleus and incus not discovered. No fistula of the oval window. Panser's flap; no skin-graft.

The following day there was spontaneous rotatory nystagmus to the right side, and the patient was noticed to lose balance on one occasion when sitting up in bed, and fell to the left. The giddiness rapidly sub-

sided, and in two weeks the nystagmus could only be recognised behind opaque glasses. The post-operative nystagmus could be abolished temporarily by rotation in a chair with face downwards, at the rate of six turns in eighteen seconds.

August 12, 1910: Caloric tests—Right, hot and cold caused normal reactions. Left side, hot, 115° F.; and cold, 60° F., gave no reactions, and no sensations of dizziness.

Rotation Tests.—Erect ten turns in twenty seconds. Clockwise caused slight horizontal nystagmus to the left for ten seconds. Counter-clockwise rotation caused stronger horizontal nystagmus to the right lasting twenty seconds.

HEARING.			
Right.			Left.
10 cm.	Whisper		25 cm.
8 cm.	Acoumeter		22 cm.
Tone range.			
26 d.v.	Low tones (Bezold)		23 d.v.
13,000	High tones (Edelmann)		10,900.
To the right	Weber's test (c')		—
Negative	Rinne (c')		Negative.
Positive	Schwabach (meatus open)		Positive.
Neutral	Schwabach (meatus closed)		Neutral.
Neutral	Schwabach (modified by use of auscultatory tube after Bárány's method		Neutral.

Voice.—Questions asked in quiet conversational voice at a quarter of a metre from either ear easily heard when Lärm Apparat was buzzing loudly in opposite meatus.

December, 1910: Radical mastoid operation on right side. Condition similar to that found on left side, but no fistula. Ballance's flap and skin-graft.

Tested February 10, 1911: Left cavity dry everywhere; right side not quite dry in tympanic region. Caloric and rotation tests unchanged (see above).

HEARING TESTS.			
Right.			Left.
24 d.v. heard	Low		90 d.v. heard.
22 d.v. not heard	High		80 d.v. not heard.
11,500 (Edelmann)	Weber (90 and 150 d.v.) to left		10,500 (Edelmann).
—			—
Rinne.			
Negative	(c Bezold clamped)		Negative 20 sec.
Negative 10 sec.	(c' Bezold unclamped)		Negative.
Loss of 90 sec.	Air-conduction (c' Bezold unclamped)		Loss of 150 sec.
Loss of 70 sec.	(c''' Bezold unclamped)		Loss of 40 sec.
9 cm.	Acoumeter		11 cm.
30 cm.	Voice with Lärm Apparat buzzing loudly in opposite meatus (single words)		36 cm.
About $\frac{1}{2}$ metre	Sentences		1 metre.

Patient's own statement as regards his sense of *hearing* was that it was *better in the left ear than in the right*, and although there was but little alteration, he did not hear quite so well during general conversation as he used to do.

Chief Points of Interest.—(1) Fistula of superior semi-circular ampulla, which is uncommon; (2) the direct (operative) and indirect evidence of

vestibular exploration; (3) localisation of disease without spread to cochlea; (4) effect of healing on lower tone range; (5) greater acuity for middle tones on the left side, which showed greater loss for low-tone appreciation.

Mr. WEST said the Section was much indebted to Mr. SCOTT for the full details he had given. These would constitute a useful reference to members should they meet with a similar case. He asked if any observation was made as to forced movement of the eyes under anaesthesia when the probe was introduced into what must have been the upper part of the vestibular cavity. Also if the opening in the ampulla was filled by granulations, or if it was a simple, open, gaping hole. Also, if there was the appearance of abnormal contents in the vestibule itself. It reminded him of some cases in which there seemed to be a continuance of definite hearing after an operation on the labyrinth, and in particular he remembered one case in which there seemed to be no question about the presence of hearing after exfoliation of part of the cochlea. Mr. CHEATLE once brought a case of the kind before the Otological Society. The question arose as to how far in some of the cases infections of the labyrinth might invade the vestibular cavity, and still be limited by inflammatory lesions or new tissue, so that the cochlea was shut off. If so, what was the physiology of the cochlea? How did the cochlea function under those conditions?

Dr. DAX MCKENZIE joined in the expression of admiration of the way in which the details of the case were given. An interesting feature was that stated in the report of August 12, 1910, showing there were no reactions on the left side with the caloric test, and yet on rotation there was a reaction ten seconds after rotation in such a direction as to simulate left labyrinthine trouble. This apparent discrepancy between the caloric test and the rotation test showed that the caloric test was much more emphatic an indication of vestibular activity than the rotation test. The localisation of the disease to the canals and the sparing of the cochlear region was important from the point of view of diagnosis and treatment. If one got a case in which there was a history of vertigo, and in which the vestibular reactions were absent, and yet the patient could hear with the affected ear, then his opinion was that one should hesitate about operating on the labyrinth, because he would doubt the presence of severe disease.

Mr. HUGH JONES asked whether grafting would have the effect of reducing the power of hearing for middle tones on the right side. He asked because the difference between the right and left sides in that respect was so marked. He would also be glad to know whether the loss to low tones in the left ear might not be due to implication of the vestibule or of the cochlea in the disease.

Mr. A. L. WHITEHEAD asked if he understood correctly that no operation was done on the labyrinth—that a probe was merely passed in and withdrawn.

Mr. SCOTT replied that there was no deviation of the eyeballs during the cold irrigation while the patient was under the anaesthetic, but he could not be certain that the eyeballs were examined at the time the probe was passed into the vestibule. There were no granulations at the mouth of the fistula, nor did blood or pus escape from it. With regard to Mr. Hugh Jones's suggestion, the patient was always more deaf on the right side, before either operation was done. The subsequent loss of low tones he considered to be due to the scarring of the tympanum of the left ear, because on August 12 the patient could hear

tones on the low forks, although the vestibule had been explored previous to this. It was only during the healing process that low-tone appreciation was lost. No part of the bony labyrinth was removed at the operation.

NEW GROWTH OF UNKNOWN NATURE IN THE TYMPANUM.

By W. H. KELSON, M.D.

A woman, aged forty, suffering from middle-ear deafness. On the right side there was found a small rounded growth, firm to the touch, projecting downwards and inwards into the external auditory meatus from the deepest part of the posterior superior wall. It was impossible to say whether it actually involved the tympanic cavity or not. It was the size of a small pea, and cut off the view of the manubrium almost entirely. It had not quite the hardness of an exostosis. There had been no discharge from the ear for many years. The patient was shown to elicit opinions as to the nature of the growth and the probability of improving the hearing by any operation. The other ear was practically normal.

Mr. WESTMACOTT said examination with a speculum seemed to show that it was a tumour of the tympanic membrane posterior to the handle of the malleus—a fibroma arising from the tympanic membrane or from the periosteum of the malleus. It was very sensitive to touch with the probe. He would be inclined to make a semi-circular incision below the growth, and by separating the two edges of the wound to test the hearing, and if it was improved, to excise the growth.

The PRESIDENT asked if the case had been under observation for any length of time, and if so, if the swelling was found to be increasing.

Dr. KELSON replied that he had seen the case for six months. The growth was not increasing, but she was much worried by the deafness in the ear, and was anxious to have something done. He thought something of the kind suggested by Dr. Westmacott might be tried, taking care not to damage the ear.

THE UNIVERSITY AURAL CLINIC AT HALLE.

Our readers will learn with pleasure that Professor Denker, recently of Erlangen, has been called to succeed the late Professor Schwartze in the Chair of Otology at Halle. Dr. Denker's work is known to all our readers, and his personality to a considerable number, and it will be a source of gratification to them to learn that this famous clinic has been entrusted to him. The present tendency in Germany seems to be to make laryngology ancillary to otology, and several professors of pure otology have added a subsidiary laryngological section to their department. Professor Denker is known to have been an ardent cultivator of laryngology and rhinology, and we are glad to think that these subjects will, therefore, be kept well to the front at Halle.

PROCEEDINGS OF THE ROYAL SOCIETY OF
MEDICINE—LARYNGOLOGICAL SECTION.*Meeting on March 3, 1911.*DR. P. WATSON WILLIAMS, *President, in the Chair.*

SPECIMENS OF EQUINE LARYNX, AND RECORDS OF CASES ILLUSTRATING THE RESULTS OF THE "VENTRICLE-STRIPPING" OPERATION FOR THE RELIEF OF THE CONDITIONS KNOWN AS "WHISTLING" AND "ROARING" IN HORSES; DEMONSTRATIONS OF INSTRUMENTS SPECIALLY DESIGNED FOR THIS OPERATION.

BY FREDERICK HOBDAV, F.R.C.S.

The respective conditions known as "whistling" or "roaring" in horses are due in the majority of cases to partial or complete paralysis of the left vocal cord. Occasionally both cords appear motionless when the interior of the larynx is exposed, but in no instance out of 257 individual patients operated upon by the author since September, 1910, has the right vocal cord alone been observed to be paralysed.

The nerve-supply is from the recurrent laryngeal, and in a bad roarer the muscles of the left side are atrophied to such an extent that often there is scarcely a vestige of muscle-tissue discernible. Numerous attempts in the way of nerve-grafting and the application of massage and electricity along the course of the nerve have been tried, but have always been unsuccessful, and in the way of surgery many operative measures have been used. Total excision of the vocal cord, arytenoidectomy, pinning back the paralysed cord, and various other means for getting the offending organ out of the way have been tried, sometimes with temporary success, but scarcely ever with permanent good result. The wall of the larynx has collapsed afterwards or granulating tissue has appeared, and the patient has made more noise and been in more distress than ever.

The "ventricle-stripping" operation offers none of these disadvantages, as, although requiring a very delicate method of procedure, it is simple, and gives no need for injury to cartilage or other of the stronger and supporting structures of the larynx. It simply consists in removing the mucous membrane completely from the pouch or ventricle at the back of the vocal cord, with the idea that two raw surfaces will thus be made, and that the two sides will adhere together and thus completely obliterate it. If this follows, the paralysed vocal cord, which forms one boundary of the ventricle, must of necessity be retracted out of the lumen of the larynx and become firmly adherent to the wall of this organ. When permanently fixed out of the way the vocal cord no longer acts as a foreign body, and the increased space in the lumen of the larynx enables the horse to breathe freely and without distress, even when submitted to violent exertion.

The author has operated in this way upon more than 250 cases with most gratifying results. A paper recording some 112 satisfactory cases was recorded in the *Veterinary Journal* for January of this year, and, to the author's knowledge, more than 200 horses (many of them absolutely useless for fast work or work involving great exertion) have been restored

to usefulness and are now working satisfactorily and without distress. The breeds operated upon include race-horses, hunters, carriage and cart-horses, and even ponies.

Originally the thyroid cartilage was sawn through when making the incision into the larynx, but it is now proved that the operation can be done without the slightest injury to cartilage by merely incising the crico-thyroid ligament. Another improvement is also claimed by the author in that he now strips both ventricles at one and the same time, thus endeavouring to widen the lumen of the larynx to its fullest extent by obtaining adhesion of each cord to its respective side of the interior of the larynx. The operation is performed under chloroform, aided by the use of suprarenine and cocaine, and in several instances has been done under local anæsthetic alone.

The object of bringing it before the notice of the members of the Laryngological Section is that it may be discussed from a comparative aspect with a view to applying the operation, or some modification of it, to human patients, if this is not already done.

The President said it was very interesting to hear of the new method of treating "roaring" in horses, and it, of course, appealed to members of the Section. Prof. Hobday brought the matter forward with the idea that it might possibly be applicable to the human being.

Sir FELIX SEMON expressed his gratitude to Prof. Hobday for bringing the subject forward. He had taken an interest in it for many years, and had hoped that Prof. Hobday would have been able to throw some light on two points—viz., the ætiology of the disease and the muscles which were first and principally paralysed. With regard to ætiology, up to a recent date there had been much discrepancy among veterinary surgeons themselves as to whether that paralysis was of myopathic or neuropathic origin. Almost always it was the left vocal cord which was paralysed; and Colonel Fleming, late of the Army Veterinary Department (with whom he had had many talks on the subject), thought the main cause was probably an enlargement of the glands where the recurrent laryngeal nerve winds around the aorta. Colonel Fleming showed him (Sir Felix) a specimen which appeared to support that contention. But it was probably not the only cause. With regard to heredity, which the Professor had mentioned, it was well known that the celebrated horse "Prince Charlie" gave the disease to all his progeny. Stallions, especially those with long necks, suffered more frequently than did mares; climate had considerable influence, and ponies were but rarely affected. The information available was but patchy, and as the cause was not definitely known he would like to urge Prof. Hobday, who evidently had good opportunities of seeing large numbers of animals, to direct attention to that point. In reference to the second matter, as to which muscles were first and principally paralysed, it had almost always been found that the posterior crico-arytenoid muscle on the left side was the one principally affected. It was an illustration in the animal of what he had tried to show in reference to man, that in all progressive organic paralyses which affected apparently the whole of the roots or trunks of the motor nerves of the larynx, it was the posterior crico-arytenoid which suffered first, or, it might be, even exclusively. He was interested to know whether Prof. Hobday would corroborate that, so far as the disease in the horse was concerned. Even in total paralysis, it must not be believed that the paralysis was, *ab initio*, complete, because Mr. Clarke, whose work the Professor had referred to, laryngoscoped several horses, and found in two cases that what was originally abductor paralysis

passed into complete paralysis of the recurrent laryngeal nerve, just as was seen in men. As the paper was principally surgical, and the Professor had thrown out the suggestion that the operations might be useful in the human subject instead of doing tracheotomy, he had already privately told the exhibitor that he must throw some cold water on the idea, because the suggestion was based on the assumption that the respiratory need was the same in all classes of mammals. But that was not so. Legallais had shown already, one hundred years ago, that in some species of animals, and especially the horse and in the cat, the respiratory need was much greater than in other classes of animals—for example, dogs; so that horses were much more easily asphyxiated than dogs by the same degree of interference with the calibre of the respiratory tubes. Man was much more allied to the dog in that respect. Members of the Section knew well that unilateral abductor paralysis in man—which corresponded to “roaring” in horses—often enough was quite accidentally discovered, no respiratory or vocal symptoms having directed attention to the larynx at all. If, in such cases, distress in breathing was met with, it was due to a second stenosis by compression further down, such as that exerted by aneurysm or goitre, or by enlarged mediastinal glands. But unilateral abductor paralysis, and less still unilateral complete recurrent paralysis, did not cause dyspnoea, and so there would be no need for operation. If that very rare event, complete double recurrent paralysis, should occur, the patient was so ill—*e.g.*, with advanced oesophageal carcinoma—that he could not move, and as he was in bed he did not suffer from dyspnoea, and so the question of operation would not come in. The only kind of case in which laryngologists had to perform operation for the relief of stenosis in connection with paralytic trouble was double complete abductor paralysis. But then the operation suggested by Prof. Hobday would in man be only a choice of evils. In the horse anything which relieved stenosis was of great benefit, but in man that relief would be very dearly bought, as it condemned the patient to total aphonia for the rest of his life. Personally, he would be inclined to advise the patient to tolerate the tube rather than have the voice reduced to merely a toneless whisper.

The PRESIDENT added his thanks to Prof. Hobday for bringing the subject forward. He would like to know whether the Professor had had any cases due to poisoning—for instance, by lead. In the Mendips there were districts in which were old disused lead mines, in which water collected, and cattle and horses drank from that water and had lead-poisoning symptoms. If so, he asked whether those toxic cases showed the particular vulnerability of the left cord as compared with the right.

Dr. DUNDAS GRANT said there was still another reason for not expecting any great result from the operation in the human subject—namely, that, as had been so often shown, there was an extreme tendency for the regeneration of a membrane of a more or less cicatricial character, which was of much the same appearance as a vocal cord, and which afforded an obstacle to the free inspiration which Professor Hobday desired.

Dr. SCANES SPICER said Sir Felix Semon had expressed what would be the general opinion of human laryngologists on the problem raised—namely, that the fact of this operation destroying the voice put it out of court for man. In a paper in the *Lancet* some months ago Prof. Hobday had referred to the same as a cure for “grunting” in horses, so that the Professor was well aware that in the horse the operation he mentioned did destroy voice.

Dr. H. J. DAVIS asked what was the use of the vocal cords to the horse. Also, was it true that if one closed the nostrils of the horse it died of suffocation rather than open its mouth to breathe? There was a popular superstition to this effect.

Mr. CLAYTON FOX also thought the suggested operation would be inapplicable to the human larynx. There might be occlusion of the sacculæ, which would result in mucocele, and there would be as much trouble as before. In the case of bilateral paralysis he would prefer to divide both recurrent nerves, to induce the cadaveric position, or do a thyrotomy, and excise the thyro-arytænoid muscles, and seal up with sutures. In that way a breathing passage would be secured. The vocal functions would be a secondary matter.

Dr. BRONNER said he thought that in bilateral paralysis the operation suggested might be done on one side only.

Prof. HOBDAY, in reply, thanked the Section for the opportunity to show the specimens. He knew the difficulties in operating on the human larynx were greater than in the case of the horse, and the work was much more delicate; but in the smaller animals the veterinary surgeon also had delicate operations, and he was much indebted to surgeons who operated upon the human subject for hints in technique. With a horse, except in the case of a valuable brood mare or a valuable stud animal, unless it could be returned to be of utility, the veterinary surgeon was not thanked. In the case of the horse it did not matter very much if there were granulations around the tube, so long as it was not a sufficient obstruction to block the breathing. But in the case of a hunter which was a roarer, the insertion of the tube meant the "beginning of the end," for, on the average, it did not do more than two seasons afterwards. The crico-arytænoid joint was sometimes ankylosed, and the larynx in the horse was converted from a cartilaginous substance into something which was harder. The functions of the cords in the horse were for neighing; the loss of that capacity did not matter so long as the other condition was cured. He had not met with cases of lead-poisoning which had caused roaring amongst horses. He could not be positive as to the origin of the condition, but he inclined to the view that it was neuropathic. Two points required consideration: the hereditary one, and, secondly, to try to do away with the disease known as strangles, which caused enlargement of the glands in the region of the larynx. Stallions were more commonly roarers than geldings, and this condition was met with in geldings more than mares. Statistics also showed that ponies rarely became roarers. It was said to be due to the fact that thoroughbred stallions were kept indoors the greater part of their lives. In some countries, where the stallion had greater freedom than in England (for instance, Australia and South America), roaring was comparatively seldom found.

CASE OF CARCINOMA OF THE LARYNX.¹

By P. WATSON-WILLIAMS, M.D.

L. T.—, female, aged forty, on November 7, 1910, was admitted to the Bristol Royal Infirmary with a view to operation, but on November 8 urgent dyspnoea supervened, and immediate low tracheotomy was performed. On November 9, under general anæsthesia, the larynx was

¹ Shown at the November meeting (see JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY, vol. XXV, p. 511).

opened in the mid-line, and the growth found to extend from the ary-epiglottic fold downwards to midway between the lower margin of the thyroid ala and upper border of the cricoid cartilage, while posteriorly and anteriorly it reached almost to the mid-line. Its upper portion extended into the pyriform fossa, causing the swelling on the outer side of the ary-epiglottic fold seen on laryngoscopy, here extending forwards to the edge of the epiglottis. The growth was removed by an incision about $\frac{1}{4}$ in. to $\frac{1}{2}$ in. beyond the apparent margin, therefore extending beyond the mid-line in front and behind, and laying bare the upper part of the cricoid cartilage on its left inner side, while above the arytenoid cartilage was removed entire, and a portion of the left side of the epiglottis.

The tracheotomy tube was removed as soon as the patient had recovered from the anæsthetic, and not replaced. Recovery was continuous and uneventful. There is considerable narrowing of the glottic lumen, due to the fact that the removed portion of the mucosa, etc., extended beyond the mid-line, and that a portion of the epiglottis, as well as the left arytenoid and ary-epiglottic fold, had been removed.

Dr. SCANES SPICER said he thought there was some indication of recurrence, not because of the large granulation, but because the thickening was so general on the affected side. He asked whether in the growth, etc., that had been removed the arytenoid was necrotic or ankylosed to the cricoid, and was it calcified? Had Dr. Williams removed any part of the cricoid cartilage at all, or of the thyroid? Had the larynx been X-rayed to see if and to what extent the cartilages were calcified? In a patient of his, one of cancer of the throat, shown in January, the amount of calcification of the posterior arch of the cricoid cartilage and of the thyroid and arytenoid was extraordinary—a circumstance which he considered to conduce to abnormal intrinsic irritation and neoplasia.

Dr. WATSON WILLIAMS, in reply, said the arytenoid cartilage was not specially examined, but it did not appear to be necrotic. He would show the specimens, probably at the Bristol meeting. No portion of thyroid or cricoid alæ were removed, but he split the thyroid and cricoid. The growth extended down over the surface of the crico-thyroid membrane of the left side, and he had to carry his incision down to the inner surface of the left half of the cricoid cartilage, and forwards and backwards up to and beyond the middle line. He removed the arytenoid and the whole ary-epiglottic fold and the left edge of the epiglottis, and removed the portion of growth which seemed to extend into the pyriform fossa. He was now carefully watching the granulations. The point about the granulations in the centre was that that was the spot least likely for recurrence.

ENDOTHELIOMA OF THE PALATE, WITH METASTATIC GROWTH IN THE NECK, TREATED BY RADIUM.

By J. GAY FRENCH, M.S.

The patient, a woman, aged sixty-three, came to hospital early in May, 1910, giving a history of having first noticed a swelling in the roof of her mouth twenty-one months previously; this gradually increased in size, but gave rise to no pain or hæmorrhage. Three months after the appearance of this swelling she noticed another in the right side of her neck, which also continued to become larger.

On examination she was found to have a large ulcerating mass involving the whole of the right half of the soft palate. There was also

a tense elastic swelling about the size of a pigeon's egg situated at the apex of the right posterior triangle of the neck, freely movable and not attached to the skin. Wassermann's reaction proved negative.

The patient was admitted into the hospital, and the tumour in the neck removed under a local anæsthetic. It was found to be situated in the fibres of the right sterno-mastoid muscle, these being spread out over the growth, which was encapsuled and was easily enucleated. At the same time a small portion of the mass in the palate was removed for examination. Dr. Shaw's report was as follows: "Palatal growth, endothelioma. Cervical growth shows, macroscopically, soft breaking-down tissue within a fibrous capsule; microscopically, it is an endothelioma with a thin layer of lymphatic tissue at the periphery."

The patient had radium applied as follows: To the palate, May 28, four and three-quarter hours; May 29, seven hours; May 30, seven hours. To the neck, June 3-4, twenty-four hours; June 9, three-hours; June 10, eight hours; June 11, two hours. In July a twenty-four-hours' application was given to both the palate and neck. Since then she has had a number of one-hour applications to the palate. The amount of radium used was 50 mgrm., with a screen of 1 mm. of platinum.

All that now remains of the original growth was a small, pale, shallow ulcer situated on the right side at the junction of the hard and soft palates.

Two microscopic slides were shown.

The PRESIDENT congratulated Mr. French on the great improvement.

Mr. HERBERT TILLEY endorsed the remark about the great improvement from radium when applied in sufficient, *i. e.* large, quantities. He had a patient, aged seventy-two, who had a squamous epithelioma of the right tonsil, invading the soft palate and side of pharynx. There was also slight glycosuria. The patient was seen by three eminent surgeons, all of whom considered the condition inoperable. As a last resort Dr. Finzi applied radium on two occasions for seven and a half hours each sitting, and three weeks after the growth had practically disappeared, leaving a large excavation in its place. The base of the ulcer was soft, except at two points on the edge of the ulcer, which probably another application of radium would cause to disappear.

Dr. SCANES SPICER said it was marvellous what a sufficiently large quantity of radium would effect in such cases as this. A case of his own at present was being treated with Dr. Finzi's 205 mgrm. of radium, and was doing very well: four fifths of the mass had vanished within three weeks of the first application for thirty hours in all, and the ulceration left was difficult to make out. Perhaps the free discharge of mucus from the pharynx for twenty hours accounted for an immediate reduction of swelling, cleansing, and pallor. The point of greatest and remaining swelling and ulceration in Mr. French's case was at the junction of the soft and the hard palate, the point at which the chief stress of muscular action of the soft palate was resisted at its attachment to the bone.

Mr. DEMESEY (Dublin) said he recently had a case of what was considered to be inoperable cancer of the larynx. The patient subsequently came to London, and was treated by Dr. Hill, and the difference in the appearance on his return to Dublin was very marked, though it was only a fortnight later. The tumour was much diminished in size, and the general condition was better. The patient subsequently succumbed. It seemed to be moderately easy to get improvement with radium, but very difficult to obtain cure. He asked whether the treatment in the present case had ceased, as he did not regard the case as cured.

Mr. DE SANTI said he had at present under his care two cases of malignant disease of the tonsil and the adjacent parts, with metastatic growths in the neck, which he proposed to exhibit before the Section, then to treat with radium, and later show the patients again. At present they might be considered as inoperable. His experience had been the same as Mr. Dempsey's, namely, that radium caused sometimes a great change, but not a cure.

Mr. GAY PRENCH, in reply, said the total number of applications to the palate in the first instance amounted to eighteen hours, and there was much diminution afterwards, though not complete disappearance of ulceration. Therefore further treatment was given. Dr. Knox gave an X-ray application, to try to close up the ulceration, and there was still a very shallow ulcer. He would be glad to show the case again in six months' time.

PORTION OF RABBIT-BONE REMOVED FROM RIGHT BRONCHUS, WHEREIN IT HAD BEEN IMPACTED FOR MORE THAN THREE YEARS, AND HAD CAUSED SYMPTOMS OF BRONCHIECTASIS.

BY HERBERT TILLEY, F.R.C.S.

W. G. —, male, aged forty-six, was admitted to hospital on January 9, 1911, complaining of "feeling ill and coughing up blood."

History.—Three years ago patient "swallowed a rabbit-bone, which seemed to stop at the bottom of the throat and to cause a tickling feeling in the back between the shoulder-blades. The patient then began to suffer from a cough which had lasted ever since. Fourteen days after swallowing the bone he was removed to an infirmary, where he "was treated for pain in the back, chest, and stomach." Eighteen months ago he coughed up some streaks of blood for the first time. There was shortness of breath on exertion; he complained of a dry throat, and he has wasted very considerably during the past six months.

Present State (January 9, 1910).—The patient is a delicate-looking man. The breathing is rapid, and a troublesome cough is accompanied by offensive expectoration tinged with blood. There is marked clubbing of fingers and toes. Pulse, 80; temperature, 100.5 F.; respirations, 36. The chief physical signs noted in the chest are: Left lung—some diminution of respiratory movement at the base, where the breath-sounds are also weak. Percussion dulness, diminished breath-sounds and vocal resonance over lower portion of scapula. Percussion note impaired over front of apex to level of third rib. Right lung—Vocal resonance and expiration increased over apex in front; breath-sounds absent over base of lung posteriorly; crepitations audible in axillary region with some increase of vocal resonance; breath-sounds diminished over base anteriorly. No tubercle bacilli found in expectoration, but Gram-plus staphylococci and streptococci. Skiagraphy did not reveal the presence of any foreign body in either lung. Urine acid; specific gravity, 1020. No albumen or casts.

Mr. Godlee deemed an operation on the bronchiectatic cavities inadvisable because of the presence of physical signs in both lungs. He kindly asked me to examine the lower air-passages by the direct method.

February 15: Morphina, $\frac{1}{2}$ gr., and atropine, $\frac{1}{100}$ gr., were injected hypodermically half an hour previous to administration of chloroform. The left lateral position was employed. On reaching the bifurcation of

the trachea the contrast between the pale mucous membrane of the left bronchus and the red congested lining of the right was very noticeable. Cocaine (10 per cent. solution) and adrenalin were then applied to the right bronchus and the extension tube passed into it, when the foreign body was sighted about two inches from the bifurcation. The swelling and profuse secretion from the mucosa made the seizure of the foreign body difficult, but when this was overcome and traction made upon it a profuse discharge of foul, amber-coloured liquid poured from the proximal end of the bronchoscope. During the simultaneous withdrawal of bone, forceps, and tube through the larynx the bone slipped from the grasp of the forceps, and a further search discovered it in the left bronchus, from which it was successfully removed.

The case is of interest because of the length of time the foreign body had been impacted, its non-detection by the X rays, the presence of definite physical signs in each lung, the marked contrast between the right and left bronchus when viewed through the bronchoscope, and the successful result which may be attained by the use of the direct method in otherwise obscure cases of lung affection.

Dr. H. J. DAVIS said Mr. Tilley had to be congratulated on the success in the case. In the *Proceedings*¹ would be found the notes of the case of a man, aged fifty-three, in whose right lung a piece of beef-bone had remained five months before it was coughed up by the patient. He was under Dr. Seymour Taylor's care with pulmonary abscess and empyema, which was drained. Recovery was complete.

The PRESIDENT also congratulated Mr. Tilley on the result. Bronchoscopy had completely transformed the prognosis of bronchiectasis from the presence of a foreign body. He asked whether Mr. Tilley encountered special difficulties in the way of extraction due to the length of time the body had been there, or was there cicatricial thickening round the body? Also, did he think it would remain patent?

Dr. PATERSON asked for information as to the progress of the case; what was the subsequent condition of the bronchus? Members knew of a case operated upon with success by inserting a tube into the bronchus, so as to prevent its contraction.

Mr. HERBERT TILLEY, in reply, said the foreign body was only removed a fortnight ago, so it was early to speak of ultimate results in the lung. He remained in hospital for a week, and at the end of that time the amount of discharge was very much diminished. But one must assume that the bronchiectatic tubes had lost some of their elastic tissue. Three days after the operation the patient was eating well, and was better than he had been for years. He was now at a convalescent home, and if it was desired Mr. Tilley could show him on his return. There were considerable difficulties in the operation; the amount of secretion was very large, and directly the right bronchus was touched it began to exude blood, and one had to apply mops moistened with cocaine and adrenalin. Morphia and atropine were injected half an hour before the chloroform was given in order to lessen exudation. When he got hold of the foreign body he levered the forceps as far as possible, and then drew the bone through a bunch of granulation-tissue; some oozing of blood took place immediately, followed by a gush of foul-smelling fluid.

¹ JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY, vol. XXV, p. 125.

A TOOTH REMOVED FROM THE FLOOR OF THE RIGHT ANTRUM IN
PATIENT WHOSE CORRESPONDING NASAL CAVITY WAS OBSTRUCTED
BY A NASAL POLYPUS.

BY HERBERT TILLEY, F.R.C.S.

Miss K—, aged sixteen, complained of constant colds during the past four months and complete nasal obstruction on the right side. Examination revealed the presence of a large polypus with all the characteristics of a naso-antral polypus, and hence it was decided to operate through the canine fossa. The sinus was found to be almost filled by a thick, translucent, polypoid mucous membrane, on the lower surface of which the tooth (exhibited) was lying free. The nasal polypus seemed to take origin from the upper, inner surface of the posterior antral wall, and it was freely removed from this area. The inner wall of the sinus was also taken away, and the bucco-antral wound sutured. Recovery was rapid and uneventful.

TUMOUR OF RIGHT SIDE OF NECK INVOLVING THE PHARYNX IN A
WOMAN AGED THIRTY.

BY W. H. KELSON, M.D.

Mrs. B—, married four years; no children or miscarriages. Swelling began seven years ago as a small lump at the back of the neck, which, however, was always fixed. About five years ago an incision was made into it by a surgeon, but nothing is said to have come out, and it healed up in a few days. Patient was first seen at hospital in November, 1910, when she complained of very severe pain in the right side of her head, which prevented her getting sleep. She was then found to have a mass on the right side of the neck, limited *behind* by the middle line, *in front* by the sterno-mastoid muscles, above by the superior curved line of the occiput, below by a horizontal line on a level with the cricoid cartilage. Tumour was firm, fixed to deeper parts, but not adherent to the skin. On examination of the pharynx, a rounded mass was to be seen behind the posterior pillars of the fauces on the right side extending up and down as far as the finger could reach, but not adherent to the mucous membrane.

Although the case was an unfavourable one for operation patient and her husband were exceedingly anxious to have something done. An incision was therefore made, and a mass of the growth, which appeared to take origin just in front of the transverse processes of the cervical vertebrae, removed. The wound healed well, and the pain, which previously was of a severe, bursting character, disappeared after the operation.

Microscopic slides were shown.

MR. DE SANTI judged, from the specimen under the microscope, that the disease was probably sarcoma, and he thought it was inoperable.

DR. PATERSON said he saw a similar case some time ago which had a like history. Four years before a surgical colleague had removed it by an extensive operation, but there was recurrence around the tonsillar region. The question was whether anything further should be done, but Mr. Butlin, who saw the case, strongly discouraged operation. He regarded it as lymphadenoma.

MR. ROBINSON said that, judging from the first of the sections

exhibited, he regarded the tumour as a myxo-chondroma, or myxo-chondro-sarcoma, and that it had recently taken on more rapid growth, as shown by the more embryonic tissue.

Dr. KELSON, in reply, said he thought the case proved that a partial operation in some instances of slowly growing sarcomata was indicated. The case went to a large general hospital, and it was sent back as inoperable. That might be so in regard to complete removal, but the woman had been relieved of her agonising pain, and the growth was now smaller than formerly. He had seen some of these patients going on for years, one for ten years, under those conditions, and he thought the fact of not being able to get away the whole of the growth need not necessarily make it inoperable.

ULCERATION OF THE PHARYNX, (?) DUE TO PYORRHEA.

By L. HEMINGTON PEGLER, M.D.

C. H. —, aged sixty-four, labourer, has complained of pain at back of tongue and right side of jaw for nearly a year. There is considerable difficulty in opening the mouth widely. No loss of weight—no history of syphilis. On first examination at hospital there was much pyorrhœa and ulceration of the gums around the last two molar teeth of the right side. The ulceration is superficial and extends on to the anterior portion of the fauces; the edge is not very well defined. There has been no enlargement of lymphatic glands. Several teeth have been extracted, since when the conditions show some improvement.

CASE OF PARTY-WALL CANCER OF LARYNX AND ESOPHAGUS.

By L. HEMINGTON PEGLER, M.D.

A. M. —, female, aged forty-five, married, has complained of sore throat since Christmas, 1910, difficulty in swallowing and cough. On examination, there is a large mass of growth obstructing the lumen of the lower part of the pharynx, and evidently springing from the posterior wall of the cricoid. There is no ulceration to be seen. The lymphatic glands of both sides of the neck are considerably enlarged. From a diagnostic aspect this case has some interest when viewed in association with the next. Opinions are solicited as to the suitability of the case for radium treatment.

Mr. DE SANTI asked if it was considered that the case was operable. He had had a case in a young woman, aged twenty-nine, with similar malignant disease of the party-wall, where the whole of the larynx was removed, as well as the œsophagus from its commencement to the level of the top of the sternum, the thyroid gland, and a mass of enlarged cervical glands; gastrostomy was done at the same time. She recovered from the operation, but only lived for five or six months longer. The nature of the operation had been previously explained to the patient, but she chose to have it done. In another case a young woman had cancer of the party-wall and glands in the neck. A colleague of his did a similar operation, namely, removal of half the larynx, five rings of the trachea, part of the œsophagus, and part of the pharynx, and did gastrostomy; since then the patient had actually got married. The operation was done one and a half years ago.

The President said it would be interesting to know whether radium

treatment would do any good in the cases. He asked for illustrations of the condition now to compare with that later on.

Dr. SCANES SPICER considered the case unsuitable for radium, because the growth so extensively involved the posterior arch of the cricoid. He did not think the radium tubes could be tolerated there long enough.

TUBERCULOSIS OF THE LARYNX.

By L. HEMINGTON PEGLER, M.D.

A. L.—, female, aged fifty-five. History of hoarseness and sore throat and cough for twelve months. On examination: Thickening of left vocal cord, with superficial ulceration and considerable swelling in arytaenoid space, the mucous membrane here being redder than normal, but shows no ulceration. The right vocal cord is healthy. Has been taking potassium iodide for three weeks with no improvement.

ANTRUM SUPPURATION: NASAL ANTROSTOMY FOLLOWED BY BLOCKING OF THE NASAL DUCT.

By DAN MCKENZIE, M.D.

The patient had been suffering from symptoms of left antrum suppuration for two or three years, with pain under the left eye and cough and bronchitis. Nasal antrostomy was performed on December 5, 1910, the anterior end of the inferior turbinal being removed, the nasal wall of the antrum broken down and the cavity curetted. On December 25 the left eye became red and inflamed, and since then the patient has been troubled with epiphora and the occasional discharge of pus from the punctum lachrymale. In the meantime the nasal condition has very much improved, there is no pain, little or no purulent discharge from the nose, and no chest symptoms.

The probability is that the involvement of the nasal duct has been due to a wound of its lower end inflicted at the time of operation, and not to a spreading infection from the nose up a healthy nasal duct. Wounding of the nasal duct in operations on the nose would seem to be uncommon, but infection of the nasal duct in nasal sinus suppuration is still more uncommon, doubtless because of the protected position of the orifice, coupled with the fact that the direction of its currents is from above downwards.

Dr. H. J. DAVIS said there was no doubt, from the patient's statement, that the lacrimal sac was infected. It should be excised, and he did not think the patient would get well until that was done.

Dr. DUNDAS GRANT thought something less radical than excision of the lacrimal sac should be tried. The canaliculus might be slit up and a style passed down. A sufficient opening for the nasal duct could be chiselled inside the nose to take its place. He had mentioned on one occasion that he injured a nasal duct when using a rectangular knife (Macdonald's)—one of a set which cut in three directions. There was some temporary trouble, but it was soon recovered from. He saw Professor Passow do the chiselling operation in Berlin, and the result was very good.

Mr. CLAYTON FOX did not think excision of the lacrimal sac was wanted. He thought a style longer than the usual one should be passed

down the nasal duct, and probably patency would be secured after wearing it for a few weeks.

Dr. PATERSON said that such cases had been reported, and had been attributed to the use of instruments which acted by cutting towards the operator. He had seen a number of cases in the last two or three years in which there was a tendency to contraction of the inner wall opening. Most of those had been done by a burr being pushed in, and the opening had contracted up afterwards. He had seen one or two which had been done by members of the Section, and in which the opening had to be enlarged afterwards. In some there was not enough of the lower turbinate taken away, so that it flapped on to the opening.

Dr. BRONNER thought that the mucocele might be due to inflammation in the nose, which had spread up the lacrimal duct, and that there need not necessarily have been any lesion of the duct. Many cases of mucocele and conjunctivitis were due to intra-nasal disease. He suggested that the ordinary method of treating inflammation of the lacrimal sac should be tried—namely, passing a probe and syringing out the sac.

Dr. LAMBERT LACK thought such cases were fairly common, but the lacrimal obstruction was nearly always temporary, passing away in a month or two. He thought the present case would get well if left alone.

Dr. McKENZIE, in reply, said the patient was already under treatment by an ophthalmic surgeon, who was catheterising the duct regularly. He had not so far proposed surgical treatment of the canaliculus or the lacrimal sac. During operations on the nose the duct was doubtless frequently injured, and yet interference with the functions of the lacrimal apparatus did not occur. The reason for this, he thought, was that in nasal operations the nasal duct, if opened freely, would not undergo stenosis, whereas if it were injured without being freely opened stenosis would probably result. In the present case he thought there had not been enough inferior turbinal removed, and that it had undergone contraction, and blocked the orifice of the duct beneath. He would await events, and if the case did not clear up he would remove the remainder of the inferior turbinal, or adopt the measure suggested by Dr. Grant.

The PRESIDENT thought Dr. Bronner's suggestion a good one. His experience was that the epiphora nearly always passed off. In many cases the nasal duct was wounded at the lower end, and it was a matter of chance whether one particular operation or another caused the obstruction. It would be worth while to wait longer, and then slit the canaliculus, and if cure did not result, remove the lacrimal sac.

CICATRICAL OBLITERATION OF THE NASO-PHARYNX (HEREDITARY SYPHILIS).

By DAN McKENZIE, M.D.

The patient is a male, aged twenty-seven. When first seen a year ago he said he had never been able to breathe through his nose. On examination the soft palate was seen to be caught up and back, and to be adherent to the upper part of the posterior wall of the naso-pharynx. Perhaps it would be more correct to say that there was no soft palate at all, and that the naso-pharynx was blocked by a mass of scar-tissue. Through this scar-tissue a small foramen led into the nose.

The case did not look like one that would benefit from a cutting

operation—either the raw edges of the wound would reunite, or, remaining open, would, in the absence of the movable velum palati, end in rhinolalia aperta and kindred discomforts. Consequently an attempt was made to dilate the small opening with a laminaria tent. The result was rather embarrassing. After the tent had been left *in situ* for a few hours attempts were made to remove it, but unknown to us it broke off short, and a portion remained inside. During the few weeks following ulceration set in around the opening, and spread until checked by large doses of potassium iodide. The patient was now able to breathe through his nose. Five months later complaints of purulent discharge from the nose led to the discovery of a hard, loose substance in the back of the left nasal cavity. Under an anæsthetic this was removed and found to be the remains of the tent. Specimen shown.

The ultimate result of the patient's experiences is that he can blow his nose satisfactorily.

(?) LUPUS ERYTHEMATOSUS OF THE MUCOUS MEMBRANE OF THE
CHEEKS OF OVER TWELVE MONTHS' STANDING.

By H. LAMBERT LACK, F.R.C.S.

Various treatments have been adopted, including the removal of all the teeth under the impression that the condition was due to sepsis. The exhibitor considers treatment useless, but will be glad to hear opinions as to the diagnosis and any suggestions for treating the condition.

A NEW FORM OF BURR FOR USE IN THE ANTRAL OPERATION BY THE
NASAL ROUTE.

By SOMERVILLE HASTINGS, M.S.

APHONIA IN A BOY, AGED TEN.

By W. JOHNSON HORNE, M.D.

Loss of voice coming on gradually over two years. Last four or five months really bad. Dysphagia. No family history of phthisis. Thorax: physical signs. Sputum: plentiful, but not examined.

APHONIA IN A WOMAN, AGED TWENTY-EIGHT.

By F. F. MUECKE, F.R.C.S.

Became hoarse when aged three, following scarlet fever. Since about fifteen years old the voice seems to have got gradually stronger. Otherwise in perfect health. The right vocal cord is seen somewhat atrophied and perfectly flaccid. The left vocal cord has disappeared, old scar-tissue being seen in its place. The ventricular bands are rounded and very large, and on phonation come forcibly together, and can be seen vibrating freely. The arytenoids turn inwards, assisting the ventricular bands to close the glottis, their inner surfaces touching firmly during phonation. The voice is firm, but husky and round, with a somewhat falsetto quality.

THIRD INTERNATIONAL LARYNGO-RHINOLOGICAL CONGRESS AT BERLIN,

AUGUST 30 TO SEPTEMBER 2, 1911.

DR. B. FRÄNKEL, *President*.
DR. A. ROSENBERG, *Secretary*.

ACCORDING to the present programme a social gathering of the members of the Congress will be held at the Reception Rooms of the Herrenhaus, Leipziger-strasse 3, on August 29 at 9 a.m.

The official opening of the Congress will take place in the Sitzungssaal of the Herrenhaus on August 30 at 9 a.m.

The business of each of the four days of the Congress will be commenced by reports on the following subjects, to be followed by discussion, viz.:

First day: "The Relations of Experimental Phonetics to Laryngology." Introduced by Dr. Gutzmann (Berlin) and Dr. Struyken (Breda).

Second day: "Bronchoscopy and Esophagoscopy, their Indications and Contra-indications." Introduced by Dr. Killian (Freiburg), Dr. Kahler (Vienna), and Dr. Chevalier Jackson (Pittsburg).

Third day: "The Lymphatic Apparatus of the Nose and Nasopharynx in its Relation to the Rest of the Body." Introduced by Dr. Broeckaert (Ghent), Dr. Poli (Genoa), and Dr. Logan Turner (Edinburgh).

Fourth day: "The so-called Fibrous Polypi of the Nasopharynx, the Place and Mode of their Insertion and their Treatment." Introduced by Dr. Jacques (Nancy), and Dr. Hellat (St. Petersburg).

The debates will be followed by other papers, announced by members of the Congress. Members intending to read papers are kindly requested to send the titles as soon as possible to Prof. Rosenberg, Berlin N.W., Schiffbauerdamm 26.

A Scientific Exhibition of Instruments and Apparatus will be held, illustrating the development and the present state of Experimental Phonetics and of Broncho- and Esophagoscopy. Intending exhibitors are requested to communicate with Prof. Heymann, Berlin W., Lützowstr. 60.

On the conclusion of the Congress on September 2 at noon a special train will leave for Dresden, giving members an opportunity of visiting the International Exhibition of Hygiene.

Those who intend to take part in the Congress are requested to send their name and address, together with visiting card and membership fee of 25 marks, to Herrn Geheimrat Dr. Schötz, Berlin W., Kurfürstendamm 22, at an early date. Cards admitting ladies accompanying members may be obtained from the same address at the price of 10 marks. Ladies joining the Congress as full members pay the membership fee of 25 marks.

Abstracts.

LARYNX.

Fournié.—*Intro-laryngeal Epithelioma; Thyrotomy; Fulguration.*
"Gazette des Hôpitaux," September 29, 1910.

In May, 1909, a man, aged seventy, was seen by the author suffering from hoarseness of some months' duration. He had been previously

treated with iodide without improvement. Examination revealed a papilloma occupying the anterior third of the left cord, yellowish-white in colour, sessile, with a zone of hyperemia about its base. The cervical glands were not involved. Microscopic examination decided the diagnosis of epithelioma.

March 29.—Thyrotomy was performed. The crico-thyroid membrane and thyroid cartilage were divided and the anterior third of the left cord was removed.

Fulguration was then practised by the Keating-Hart's method for four minutes. The breathing was unaffected throughout the procedure. The wound was then closed, catgut sutures being used for the crico-thyroid and thyro-hyoid membranes, and silk-worm gut for the muscular and cutaneous planes. The thyroid cartilage was not sutured. A gauze wick was inserted into the inferior angle of the wound.

April 13.—The external wound had cicatrised with little adhesion to the skin. A white false membrane covered the intra-laryngeal operated area.

April 23.—A smooth red polyp the size of a pea was noticed at the seat of the operated cord: this gradually diminished in size, and had disappeared at the end of May. When seen again in June, 1910, the patient had gained considerably in weight, and there was no return of the growth.

The following are quoted as points of interest in the case:

(1) Absence of subcutaneous emphysema and perichondritis; spontaneous union of the thyroid laminae, notwithstanding the absence of cartilaginous suture.

(2) Uselessness of dividing the cricoid (it was left untouched in this case).

(3) The post-operative appearance of a polyp, really due to fulguration, and which disappeared spontaneously.

H. Clayton Fox.

EAR.

Beck, Oscar.—*The Auditory Nerve and Multiple Sclerosis.* "Monats. f. Ohrenh.," year 44, No. 10.

The account of the following two cases succeeded by the author's critique thereon form the subject of this article.

K. U——, aged thirty-one, a clerk, up till three months before had no illnesses (the case was shown at a meeting of the Austrian Otological Society, April 26, 1910). No misuse of alcohol or tobacco, no venereal infection. Wassermann reaction negative.

Three months before the patient began to suffer from occasional attacks of giddiness, which were especially associated with mental efforts and quite independently of any position of the head. There was no vomiting or tinnitus. He had no definite idea as to the apparent direction of the movement of objects; but it seemed to him that he heard worse in the left ear after these attacks.

Examination of the Ears.—Membrane normal on both sides. Very slight spontaneous nystagmus, rotatory and horizontal, to both sides, definitely stronger to the left (the diseased side). On looking upwards and downwards vertical nystagmus, but not constant. On looking directly forwards no nystagmus but convergent strabismus.

On the right side normal appreciation of sound, normal labyrinth reaction.

On the left side total deafness (with Bárány's noise apparatus). Absolute failure of response to the caloric test with water at 45 degrees. Duration of the after-nystagmus with rotation one third (? of that on the right side).

During irrigation of the right (sound) ear with water at the body temperature and the patient standing he fell always towards the left whatever the position of the head.

With Romberg's test he fell always towards the left, unaffected by any alteration in the position of the head.

Patellar reflexes both sides increased and marked inco-ordination in the finger-nose test on both sides. Otherwise reflexes and nerves normal. Ocular fundus both sides normal; paresis of the abducens and spastic convergence on both sides.

The patient was examined again in three days, when it was found that with Bárány's noise apparatus he could hear conversation at half a metre on the left side. Syringing the left ear with water lower than the body temperature evoked strong rotatory and horizontal nystagmus to the right, and with water at 45 degrees nystagmus of the same type to the left, accompanied by reaching and falling towards the left independently of the position of the head. No changes were noted in the course of an observation extending over seven weeks as regards the nerves or eyes. On six occasions the cochlear and vestibular portions were completely reactionless, and four times no pathological changes could be detected apart from the depreciation of the range of hearing. The intensity of the nystagmus remained unaltered.

The second case was one of Prof. v. Wagner's, and for this the diagnosis lay between multiple sclerosis and cerebellar tumour.

F. H.—for seven months had been subject to occasional attacks of giddiness, tinnitus, and deafness. The giddiness was so severe that he often fell if he attempted to stand. Whilst lying down he felt as if the bed swung. Alteration in the position of the head had no influence on the giddiness, nor did any one position in bed seem more comfortable than another.

Examination.—The right eyeball was a little more prominent than the left; some tremor of the lid; no Graefe's sign. Corneal reflexes equal and active on both sides. No disturbances of vision. Fundus normal. Sense of smell depreciated on the left rather more than the right.

Seventh and fifth nerves normal. Tongue correctly protruded, but very tremulous. No paresis of the palate. Throat reflex normal. Tremor of the hands, but no ataxia. Patient swayed to either side on walking. Other reflexes active and equal, but there was definite ankle clonus, the duration of which and character were variable.

Ears.—Membrane normal both sides. Nystagmus in each direction on looking to the right and left; coarse horizontal and rotatory movements more marked towards the right (the diseased side) than the left. No nystagmus on looking directly forwards. On looking upwards or downwards definite vertical nystagmus, varying in intensity, but not constant.

Left ear: Hearing for all tests normal; Rinne positive, Weber to the left. Caloric response to both hot and cold water typical.

Right ear: Total deafness (tested with the noise apparatus); vestibular apparatus quite unresponsive to caloric and rotation tests.

Five days afterwards the examination was repeated. The condition in the left ear was unchanged. The right ear was still completely deaf, but the vestibular apparatus reacted to the caloric test in the usual way.

and whilst under the influence of this test and standing with the feet together the patient had a constant tendency to fall towards the right and backwards, independently of the position of the head or the direction of the nystagmus. A paresis of the movements of the eyes to the left was also noted.

The patient was examined every three to four days over some two months. The character of the ocular paresis varied very much; at times this affected the right and at times the left abducens, but there was never diplopia. The right ear remained throughout totally deaf. For half the examinations the vestibular apparatus reacted normally and for half was quite unresponsive. Vestibular nystagmus to both sides was always present, and its intensity appeared quite independent of the then condition of the labyrinth.

The differential diagnosis Beck considers lay between hysteria, cerebral tumour, and multiple sclerosis for both these cases. Hysteria could be dismissed, as the deafness was constant in one case and no other hysterical stigmata were detected, nor would the variability in response of the vestibular apparatus conform to this view. An intra-cranial tumour causing no other nerve lesions except a paresis of both external recti was inconceivable. The transitory affection of the labyrinth would seem to denote some involvement of the eighth nerve itself, and it was impossible to regard this as the result of some tumour causing no optic neuritis, and which gave rise to no other symptoms. Acute affections of both vestibule and cochlea due to a retro-labyrinthine origin were rare, and only occurred in fractures of the base, embolism, hæmorrhages, and leukæmia, but had also been referred to "polyneuritis cerebrolis Ménière-formis." Ruttin had laid it down as a rule that sudden disturbances affecting the cochlea with the vestibular apparatus remaining intact, and suddenly arising vestibular symptoms, the cochlear nerve being unaffected, were to be referred to some lesion situate proximal to the labyrinth, whilst sudden disturbances of both portions of the eighth nerve together were more likely to be due to some intra- rather than extra-labyrinthine cause. A case, however, of this observer's which had been diagnosed as one of cerebellar tumour had proved to be an isolated disease of the vestibular nerve caused by rheumatism, and had completely cleared up within fourteen days under salicylates. Cases of isolated affection of the vestibular nerve had also been recorded by Neumann and others which had proved to be dependent on herpes, lues, and ptomaine poisoning. Recurring attacks of total loss of function of both the cochlear and vestibular portions of the eighth nerve simultaneously, alternating with periods of complete restoration of their function, had hitherto not been recorded, but would, perhaps, best be explained as due to some lesion situate proximal to the labyrinth and most probably in or around the nerve-trunk itself.

In these two cases of the author's the varying conditions as to functional integrity and paresis would correspond well with a diagnosis of multiple sclerosis, as did also the disagreement between the objective examination and the slight subjective condition, as regards which phenomena an analogy could be found in the appearance of the ocular fundus in this disease, where blindness might exist with an apparently almost normal retina, or the vision only be slightly affected when a high degree of pallor was to be observed with the ophthalmoscope.

The direction of the tendency to fall, which was quite independent of the vestibular and Romberg's tests carried out together, was also important and remarkable. Bárány had elaborated the differential

diagnosis which these combined tests afforded as between labyrinthine and cerebellar disease at Budapest in 1909.

The explanation of the symptoms in these two cases was due to a lesion of Deiter's nucleus, as Bárány had pointed out.

The author then refers to the various connections which have been established between the fibres of the vestibular nerve, Deiter's nucleus, the cerebellum, the cerebellar nuclei and the cells of the spinal cord in support of the theory that lesions of the cerebellum may thus produce "atypical" response to the labyrinthine tests.

As to the greater intensity of the spontaneous nystagmus towards the diseased side in his cases Beck quotes the results of simultaneous irrigation of both ears as described by Ruttin. If the two normal labyrinths are stimulated in this way together with water under the body temperature the tendency is for the production of a nystagmus to each opposite side equally, with the result that the one counteracts the other and no nystagmus occurs. If, however, the function of one labyrinth be impaired then the effect on the healthy side predominates and a nystagmus towards the diseased side is the result. Further, Ruttin was able to satisfy himself as the result of these investigations that the fibres which connected the vestibular nucleus and cerebellum possessed a controlling faculty, and that thus if the function of the cerebellum were impaired, *e. g.* by the presence of an abscess or tumour, then this controlling action would be absent on that side, and thus a spontaneous nystagmus towards the diseased would result.

This clinical condition has already been described by Neumann and Bárány.

The response to simultaneous irrigation in these two cases was a nystagmus directed towards the diseased side. However, Beck says he must admit that the labyrinth on the diseased side certainly appeared impaired as regards the caloric test compared with that on the sound side by previous tests, yet apparently the spontaneous nystagmus in both cases was greater towards the sound side. Each vestibular nucleus must be regarded as having connections with the muscles of both eyes.

The fibres uniting the cerebellum with the vestibular nucleus have a controlling faculty, and therefore any lesion of these units on one side will result in greater freedom of the ocular muscles on the same side, and a spontaneous nystagmus to this, the diseased side, takes place. In both his two cases the author observed a stronger nystagmus towards the diseased side, and for this reason combined with the data as regards the tendency to fall described above, Beck concluded that he could diagnose a sclerotic plaque in the cerebellum in both cases, and in addition in order to explain the auditory lesion another plaque involving the nucleus of the eighth. Finally, in order to account for the varying and partial affection of the vestibular branch, Beck alludes to the already established fact that this portion is always the last to show signs of disturbance in cases of any injury or disease of the eighth nerve as a whole, and he would further consider that both cases fall into the same category, the one being in a more incipient and the other a later stage.

The article is certainly of great value as a record of a certain pathological syndrome, and should be of especial interest to the aural surgeon in the differentiation between labyrinthine and cerebellar disease, which is now no small portion of his rôle.

The subsequent history of these cases will be awaited with interest.

Alex. R. Tweedie.

REVIEWS.

Surdus in Search of his Hearing: An Exposure of Deafness Quacks and a Reliable Guide to the Best Means of Help for the Deaf. (Second section.) By EVAN YELLON. London: Evan Macleod, 1910.

Under the sub-title of "Exposure of Deafness Quacks, Frauds on the Deaf, and a Reliable Guide to the Best Means of Help for the Deaf," the author gives a reasonably correct description of this work, with the second section of which we have been favoured. The author appears himself to be the subject of extreme deafness and to be keenly interested in searching for whatever may be of benefit to his fellow-sufferers. The portion of his book which deals with "deafness quacks and quackery" is of the utmost interest. While to the aurist it is all comparatively self-evident, it will be found extremely instructive to those of the lay public who are likely to be entrapped by the individuals whose methods are described (p. 10). He advises the deaf to keep out of the hands of one of them, but since the publication of his book the hand of human justice has done away with any further possibility of fraud on his part. A very temperate and convincing chapter on the difference between advertising quacks and qualified specialists is well worth perusal. In the part of the book dealing with genuine aids for the deaf, including various forms of speaking trumpets, electric aids, etc., great prominence is given to the apparatuses devised by one well-known maker in the Strand, but there is another one in Oxford Street whose elegant and efficient appliances also deserve the highest meed of praise. Everyone should read the chapter on the self-cure of tinnitus or noises in the head which induces a form of relief and consolation which, though hardly worthy of the name of cure, is calculated to be a great blessing to those who are suffering from this peculiarly distressing and obstinate symptom. It consists mainly in the voluntary endeavour to blend with the tinnitus the recollection of sounds, musical or spoken, which may stir up agreeable emotions. Whether the practice of these auto-suggestive methods is likely to have a strengthening effect on the mental fibre is somewhat doubtful, but it will be generally admitted that if they counteract the depressing effect of the tinnitus they have certainly a field of usefulness of their own. The writer's opinion with regard to the curative effect of vibration and discharging ears will appeal to the lay reader rather than to the professional one, but his views on open-air recreations for the deaf must, and will, command respect and attention.

The book is written with such conviction and brightness that our readers will be grateful for having their attention drawn to it.

Dundas Grant.

Hay-fever and Paroxysmal Sneezing (Vaso-motor Rhinitis). By EUGENE S. YONGE, M.D. Edin. Edinburgh and London: Wm. Green and Sons, 1910, pp. 150. With 2 coloured plates.

Dr. E. S. Yonge is already favourably known to us as the author of a well-written book upon nasal polypus, in which the closely reasoned style of his writing marked him down for distinction. In a field already strewn with discarded theories Dr. Yonge was bold enough to throw down another gage of battle, and if he did not carry the day he nevertheless won our applause as a doughty dialectic champion. In this, his

further essay in medical literature, Dr. Yonge eschews controversy. With one or two exceptions he produces no new facts to arrest our attention, no novel theories to start us thinking. As a consequence his book may in this respect occasion some disappointment to his *confrères* in the special domain of rhinology, but, taken for what it is—an exhaustive and readable compilation of more or less familiar facts and views upon hay-fever and paroxysmal sneezing—his latest work is worthy of every approbation.

The exceptions in the way of novelties, at which we have hinted, are to be found in the section on treatment. One of them is the method of treating hay-fever, suggested and carried out by the author, and no doubt already known to our readers, namely, resection of the nasal branch of the fifth nerve in the orbit as it passes from the posterior to the anterior ethmoidal foramen. The operation is not difficult, but with admirable honesty Dr. Yonge now tells us that its benefits, though considerable at first, have not hitherto proved to be permanent, save in one or two cases.

The other novelty is the recommendation to spokeshave the septal tubercles for the cure of vaso-motor rhinorrhœa (a more suitable term than vaso-motor "rhinitis"). This method of treatment, for which he expresses his indebtedness to Mr. R. Lake, of London, the author has found very successful. So far as we are aware the operation is not in general use, but there is no doubt that Dr. Yonge's advocacy of it will ensure its careful trial.

The book throughout bears traces of wide reading, and the bibliography is particularly complete; but we were unable to find any allusion to Mr. Francis's method of cauterising the septum in paroxysmal rhinorrhœa and asthma—a method which is gradually gaining popularity, though not invariably successful. With regard to Dunbar's treatment of hay-fever by pollutin and Weichardt's treatment of the same disease by graminol, the author, although he describes them in full detail, discreetly refrains from expressing any decided opinion upon their results—a point in which discretion is not necessarily the better part of valour.

We conclude with a word of gratitude for the extremely interesting historical summaries with which the author introduces his subject. They are at once brief and complete, and show that Dr. Yonge has no slight acquaintance with the classic literature of Greece and Rome. With reference to the question, *Cur sternuentes salutamus?* which the author thinks is still unanswered, may we remind him that, according to some authorities, the "good luck" of sneezing lay in the belief that the sneezer thereby got rid of an evil spirit? Probably, however, the real explanation may be found in the simple fact that sneezing (in moderation) induces a pleasant feeling of lightness and refreshment—surely quite sufficient cause for congratulation in this world of dull days.

D. M.

BOOKS RECEIVED.

Atlas of Radiography of the Mastoid Region and of the Accessory Sinuses.
By JOSEPH C. BECK M.D. St. Louis: The Laryngoscope Co., 1911.

THE
JOURNAL OF LARYNGOLOGY,
RHINOLOGY AND OTOTOLOGY.

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FIBROLYSIN IN OTOTOLOGY.

BY MACLEOD YEARSLEY, F.R.C.S.,

Senior Surgeon to the Royal Ear Hospital; Consulting Aural Surgeon to the
Royal School for the Deaf and Dumb at Margate; Medical Inspector
of London County Council Deaf Schools, etc.

So large a literature has already accumulated upon the uses in otology of thiosinamin and its derivative fibrolysin that I have felt some hesitation in adding thereto. But since opinions, both in Great Britain and on the Continent, appear to be very much divided, I have thought that the publication of further experiences might be of some possible value, and I therefore offer for consideration the results of its use in the twenty cases which I selected for trial.

Before entering upon these experiences, however, it will be well to review those published by other observers, and to describe briefly the nature of the remedy.

Thiosinamin, known chemically as allyl-sulpho-urea, is obtained by the action of ammonia on essence of mustard, and occurs in colourless monoclinic or rhombic crystals, with a bitter taste and garlic odour. These crystals dissolve well in alcohol, very badly in water, and slightly better in hot water. It was first prepared by Berzelius, of Stockholm, in 1828. Its derivative, fibrolysin, we owe to F. Mendel (1), who succeeded in improving the aqueous solubility of thiosinamin by the addition of salicylate of soda in

the proportion of one molecule of the former to half a molecule of the latter, whereby the painful nature of injections of the alcoholic solution of thiosinamin has been abolished by the substitution of the aqueous solution of fibrolysin. This solution has been further improved by Michel, of Paris, by using one molecule of thiosinamin with half a molecule of antipyrin, thus forming a syrupy liquid at ordinary temperature, more soluble in water than fibrolysin. This solution has been made use of in otology by Lermoyez and Mahu (2), who give its composition as—

Thiosinamin	15.0	gm.
Antipyrin	7.50	„
Distilled water	100.0	„

Thiosinamin appears to possess the peculiar property of softening cicatricial tissue, and this selective action has been explained by Glas (3), quoted by Lermoyez and Mahu. The drug causes an œdema in cicatrices, their limits become less marked, and it is impossible to distinguish them from the tissue immediately adjoining them. The nodules appear to be separated, the fibres swell up and are dissociated. The action of thiosinamin is comparable to that of venous stasis as produced by Bier's method. There is produced interstitial œdema and softening. This "lymphagogue" action is not produced in healthy tissues provided that therapeutic doses are not exceeded. In toxic doses thiosinamin produces in frogs, according to Lange (4), a persistent anasarca. Besides this, it provokes (Doliker), as early as four hours after its administration, a very marked leucocytosis, and, influenced by a kind of positive chemiotaxis, the leucocytes travel towards the cicatrix and act as phagocytes upon the cicatricial tissue (Sugar [5]). Thiosinamin softens cicatricial tissue, but does not destroy it. Its effect is rapid, frequently demonstrable at the end of four hours, but is often of a passing character, and the benefit disappears some days after the cessation of treatment. Thiosinamin can thus only be an auxiliary to mechanical treatment, which should in its turn be used to extend definitely cicatrices which have become distensible under its use (Teleky [6]).

According to Lermoyez and Mahu, thiosinamin is a non-toxic, inoffensive agent. They quote van Horn as carrying out treatment upon two female patients, over a course of fifteen months, by injections two or three times weekly of a 15 per cent. alcoholic solution, a dose which produced at length a slight loss of appetite and feeling of fatigue, which disappeared rapidly on stopping the treatment.

In spite of the assertion that thiosinamin is an inoffensive agent, certain published cases show that it can be dangerous. Thus Teleky quotes the case of a young man who had undergone a gastrostomy for cicatricial contraction of the œsophagus. Fibrolysin was used after some weeks, and, whilst it was possible easily to dilate the stenosis, the patient's death was caused by rupture of the gastric cicatrix. Hebra has observed old caries to light up again in tuberculous persons, and afebrile tubercle to become febrile. Stocker (7) has collected a number of instances in which the use of thiosinamin has been attended with untoward results.

Thiosinamin was introduced into therapeutics by von Hebra (8), who communicated his first experiences to the Congress of Dermatology at Vienna, in 1892. In 1893, Latzka (9) published his results. Hance next applied it successfully to the treatment of urethral strictures, but Richter (10), who did not use it in conjunction with mechanical methods, failed in similar cases. Other investigators followed, until Teleky improved the technique and obtained good results by applying it methodically in cases of fibrous stenosis of the œsophagus.

The first person to experiment with thiosinamin in otology was Sinclair Tousey (11), in 1897, who improved a case of long-standing deafness by its means. Lermoyez and Mahu, inspired by Teleky and ignorant of Tousey's case, next made trial of it in their clinic at the Hôpital St. Antoine. They treated twelve cases of deafness due to chronic affections of the ear, without selection, by a series of twenty injections of $\frac{1}{2}$ to 1 cm. of a 15 per cent. alcoholic solution of thiosinamin, given by the arm. Six cases were put also under local treatment, the rest were left to the action of the drug. Results were *nil*. About the same time Robinson and Beck had satisfactory results in adhesive cases by associating with the injections otomassage and inflation, and Sugar began to use the drug successfully in adhesive otitis, carefully eliminating otosclerosis, by hypodermic injection and intra-tympanic injections by catheter of a glycerinated 10 per cent. solution of thiosinamin. Lermoyez and Mahu then returned to their researches with a different technique. They used ear-baths of warm solution, according to the formula given above, for five minutes every night, otomassage being employed twice weekly. From this trial they describe thiosinamin as "a new remedy rich in promise," and state that failures in this method are due to two causes—faulty technique and faulty diagnosis, and that the only cases of deafness in which the treatment is justified are those of adhesive otitis due

to a healed suppuration or a non-suppurative catarrh, but they add that cases must be carefully selected, and those with secondary labyrinthine complication or ankylosis of the stapes refused.

Maupetit and Coltart (12), quoting Lermoyez and Mahu, say that thiosinamin "has not fallen short of its promises, and that it is probable that otology can expect help from it." Among the authors mentioned by them as obtaining good results are Hirschland (13), Kassel, Tapia, Horeau, and Baratoux, who all combine to insist upon the necessity of associated mechanical treatment. Maupetit and Coltart used the same solution and technique as Lermoyez and Mahu, viz. local baths, with associated mechanical treatment, controlling their observations by using the latter alone, or in conjunction with baths of a 1 per cent. solution of iodide of potassium in sterile water. They give details of their results thus: "We consider this new treatment not only as useless as regards improving the condition of the patient, but more than that, hurtful. Therefore we renounce it completely. *Primo non nocere.*" In all, or nearly all their cases, the treatment set up discharge.

Poutchowsky (14) published ten personal observations treated by injecting fibrolysin. He selected patients whose labyrinthine functions were intact, and who had no trace of arterio-sclerosis nor any chronic affection of the lungs. He concluded that mechanical treatment must accompany the use of the drug, and that, although the latter has an incontestable influence on cicatricial tissue, treatment therewith alone does not give very important results.

Austerlitz (15) reports his statistics, and concludes that a severe control of the cases justified by careful functional examination for treatment must be practised during and long after employing thiosinamin.

Bichaton (16) reported twelve cases treated by thiosinamin. Seven showed no change, one was made worse, two were improved, and two preferred to discontinue. In four cases discharge followed. He concludes "that thiosinamin does not appear to us to have justified the hope founded upon it as concerns the treatment of adhesive otitis, and that in every case it is a drug to handle with caution, and the employment of which should be watched very narrowly if one does not wish to be exposed to disappointment."

Gay French (17) last year published his results with fibrolysin in this country. He reported 68 cases, of which 21 were suffering from post-suppurative conditions and 47 from chronic dry middle-

ear catarrh. Of 52 cases of deafness and tinnitus the hearing improved and noises diminished in 16; hearing alone improved in 14, and 15 gave no result. In 16 cases of deafness without tinnitus, 10 showed improvement. The method employed was hypodermic injection in the upper arm of 30 minims of fibrolysin and the intratympanic injection of 5 minims into each ear. This was followed in fifteen minutes by otomassage. The treatment lasted twice a week for six weeks. The cases were controlled by six weeks' catheter and otomassage treatment before the fibrolysin was used. French concluded that the method was more successful in the non-suppurative than in the post-suppurative cases, although the latter showed greater amounts of improvement. He thought that "in cases of non-suppurative middle-ear catarrh this method gives much better chances of improvement than any other," except in those cases which showed a thinned and stretched tympanic membrane. Results in otosclerosis were practically *nil*. In one case of non-suppurative middle-ear catarrh the treatment had to be abandoned owing to marked vertigo after each injection.

Skrypta (18) and Knowles Renshaw (19) have also published good reports, whilst Hirschland (*loc. cit.*) and Urbantschitsch (20) have considered it, the former as a means of cure, the latter as a means of obtaining results which are otherwise unattainable in otology.

My own results have not been sufficiently good to justify a continuation of this method of treatment, vaunted by some and condemned by others, in my practice. I have used it, with some slight variation of technique, in 20 cases, 7 males and 13 females, with the meagre result that three, or 15 per cent., were improved, sixteen, or 80 per cent., were unimproved, whilst in one, or 5 per cent., the improvement was doubtful. The following gives the histories of these cases in detail:

CASE 1.—Female, aged eleven. Deaf three years, no tinnitus. Adenoids removed in June, 1909. Right tympanic membrane thickened. Left tympanic membrane thickened and showing calcareous plaques. *Tests*: Weber—R. positive; Rinne—R. and L. double negative. Bone-conduction—R. + 15 sec., L. + 10 sec. Low tones—R. and L. C16 to C128 lost. Acoumeter—R. 2 ft. 6 in., L. 1 ft. 3 in. Voice—R. 10 in., L. 5 in. Whisper—R. 5 in., L. 3 in. As the hearing did not improve after the removal of the adenoids catheterisation and otomassage were used every second day for four weeks, but gave no results. On November 13, 1909, fibro-

lysin injections, hypodermic and by the Eustachian tubes, were employed every second day (thirty-five injections in all), with continuation of the mechanical treatment, until February 1, 1910. The tests gave similar results on three occasions, the last being taken the second week in February. Improvement was *nil*.

CASE II.—Female, aged thirty-seven. Deaf since scarlet fever at ten years of age. No tinnitus. The discharge lasted for "some years," and tends to return when she has a cold. Nasal septum deflected to right, with enlargement of right middle turbinate. Left tympanic membrane: Perforation in anterior inferior quadrant. Right tympanic membrane: Healed perforation in anterior segment. A submucous resection of the nasal septum, with reduction of the right middle turbinate, was performed July 16, 1909. She returned home before she was tested, and was treated by catheter and massage by her own doctor until September, when she returned to the clinic, and her tests gave Weber—L. positive, Rinne—R. and L. double negative. Bone-conduction—normal, or slight loss on both sides. Acometer—R. 2 in., L. $\frac{1}{4}$ in. Voice—R. 2 ft., L. 4 ft. Whisper—R. 3 ft., L. 1 ft. 6 in. Low tones—R. and L. C16 to C64 lost. She was then treated with fibrolysin injections (hypodermic and intra-tympanic) every second day, with daily inflation and otomassage. After ten injections her tests gave: Acometer—R. and L. 1 ft. 4 inches. Voice—R. 8 ft., L. 6 ft. Whisper—R. 1 ft., L. 9 in. She returned to hospital on November 10, 1909, and remained until December 8, during which time treatment was resumed, and she had a further twenty injections, making thirty in all. Tests at close of treatment: Acometer—R. 2 ft. 4 in., L. 1 ft. 6 in. Voice—R. 3 ft. 1 in., L. 2 ft. 4 in. Whisper—R. 1 ft., L. 1 ft. 8 in. Low tones as before treatment. These results appeared to be contradictory, as her voice hearing, at first improved, deteriorated later, whilst that for acometer and whisper improved. This improvement was maintained.

CASE III.—Male, aged twenty-six. Deaf twelve years, constant tinnitus, paracensis Willisii. Maternal uncle and aunt and younger brother deaf. R. and L. tympanic membranes normal in texture, indrawn, mallei mobile. Chronic pharyngitis, slight septum deflection, but no obstruction. Tests: Rinne R. and L. double negative. Bone-conduction—R. + 5 sec., L. + 6 sec. Low tones—R. and L. C16 to C128 lost. Acometer—R. 4 in., L. *nil*. Voice—R. 5 in., L. 3 in. Whisper—*nil*. He was treated from

September 15 to October 6, 1909, by daily inflation and otomassage, strychnine internally, and a nasal alkaline douche. On the latter date his tests gave: Acometer—R. 3 in., L. 1 in. Voice—R. 1 ft. 6 in., L. 8 in. Whisper—R. 1 ft., L. *nil*. Tinnitus not improved. On October 14 fibrolysin was commenced, as in Cases 1 and 2, with catheter and otomassage, and continued every day for two months, making thirty injections in all. On December 22 tests gave: Acometer—R. 5 in., L. 1 in. Voice—R. 1 ft. 8 in., L. 1 ft. 1 in. Whisper—R. 1 ft., L. 8 in. Tinnitus slightly improved. This slight improvement was not maintained for more than one month, and the case is, therefore, not counted as successful.

CASE IV.—Male, aged twenty-one. Deaf one and a half to two years. Five years ago had discharge from both, due to acute otitis following bathing. When seven years old had earache and "inflammation of the ears." Paracusis Willisii. No tinnitus. Worse with colds. Left ear shows anterior and posterior ivory exostoses, but with sufficient passage to obtain a good view of the membrane. R. and L. tympanic membranes dull and thickened. R. and L. mallei mobile. Nasal septum deflected to left, enlargement of R. and L. middle turbinates. *Tests*: Rinne—R. and L. double negative. Bone-conduction—R. and L. normal. Gelle—R. and L. negative. Low tones—R. C16 lost, L. C16 to C64 lost. High tones—well heard. Acometer—R. and L. 15 ft. Voice—R. 3 ft., L. 2 ft. 10 in. Whisper—R. 16 in., L. 12 in. Catheter improved voice to R. 4 ft. 3 in., L. 3 ft. 11 in. On May 22, 1907, a submucous resection operation was performed, with removal of the anterior ends of the middle and posterior ends of the inferior turbinates. From June 17 to 29 he underwent a course of daily catheterisation and otomassage and at the end of that time he heard voice—R. 7 ft. 3 in., L. 7 ft. 2 in. Whisper—R. 21 in., L. 19 in. This improvement was maintained for fourteen days after the cessation of treatment, but then gradually went back until, on October 12, he only heard voice—R. 6 ft., L. 2 ft. 9 in. Whisper—R. 14 in., L. 7 in. Otomassage improved him to some extent, but then failed to help him. As it was concluded that the deterioration was due to the recontraction of adhesions in the middle ear, left by the earlier suppuration and stretched by the treatment, fibrolysin was tried, with otomassage, for fourteen injections (hypodermic only), without result. The patient refused to persist further with the treatment.

CASE V.—Male, aged thirty. Deaf twelve to thirteen years, from "colds." Variable hissing tinnitus, not continuous. Paracusis Willisii. R. and L. tympanic membranes dull and indrawn, mallei mobile. L. vomerine crest. Hypertrophic pharyngitis. *Tests*: Weber—R. posterior. Rinne—R. and L. double negative. Bone-conduction—R. + 10 sec., L. — 5 sec. Gelle—R. and L. negative. High tones—well heard. Low tones—R. C16 and C32 lost, L. C16 to C64 lost. Acoumeter—R. 1 in., L. *nil*. Voice—R. 13 in., L. 8 in. Whisper—*nil*. He was treated by daily catheter and massage for seven days without result, then, as he was anxious to return to New Zealand and his time was limited, fibrolysin was tried at his own request. He had twenty-six injections (hypodermic only), from June 29 to July 29, 1908, with the following results: (1) After the fifteenth injection he volunteered that he could no longer hear better in a noise, and this symptom has, so far, not returned. (2) His tinnitus, in his own words, was "greatly improved." (3) On July 25 his tests gave: Weber—not lateralised. Acoumeter—R. 6 ft. 9 in., L. 3 ft. 4 in. Voice—R. 6 ft. 7 in., L. 5 ft. 5 in. Whisper—R. 1 ft. 6 in., L. 6 in. Rinne—R. and L. double negative. Bone-conduction—R. + 8 sec., L. normal. Gelle—doubtful. Low tones—R. and L. C16 only lost. One year later he wrote saying that the improvement was maintained.

CASE VI.—Female, aged twenty-six. Deaf eight years; worse since a bad cold at Christmas, 1907. Subject to colds. Tinnitus very seldom, then only faint buzzing. Paracusis Willisii since July, 1907. No family history. Never any treatment. R. tympanic membrane slightly indrawn, texture normal; L. tympanic membrane slightly indrawn, texture normal, promontorial blush. Mallei mobile. A definite pad of adenoids, with deep sulci, and adhesions in Rosenmüller's fossæ, seen by posterior rhinoscopy. *Tests*: Weber—not lateralised. Rinne—R. and L. double negative. Bone-conduction—R. — 10 sec., L. — 8 sec. Galton—R. 25,000 d.v., L. 26,000 d.v. Gelle—doubtful. Low tones—R. C16 to C64 lost, L. C16 and C32 lost. Acoumeter—R. 5 in., L. 8 ft. Voice—R. 11 in., L. 30 in. Whisper—R. *nil*, L. 6 in. On March 12, 1908, her adenoids were removed and the adhesions cleared, and from March 18 to 26 she had regular daily catheterisation, with otomassage. On March 24 she heard acoumeter—R. 13 in., left 8 ft. Voice—R. 17 in., L. 8 ft. Whisper—R. doubtful, L. 15 in. Bone-conduction—R. and L. — 7 sec. Low tones—R. C16 and C32 lost, L. C16 only lost; other tests as before. She returned home,

where treatment was continued by her own doctor. On January 13, 1909, she heard voice—R. 20 in., L. 41 in. Fibrolysin, by hypodermic injection only, was tried, in addition to the other treatment, her own doctor giving her twenty injections. One month after she heard voice—R. 17 in., L. 36 in. only. There was no change in the membrane, save that the blush on the left side was no longer visible. Ten further injections were given, but without result.

CASE VII.—Female, aged twenty-nine. Deaf three years, L. worse. Worse past twelve months, and with colds. Pulsating tinnitus, not continuous. No paracusis Willisii. Tonsils and adenoids removed in 1908. R. and L. tympanic membranes indrawn and thickened. Nasal septum deflected to L. *Tests*: Rinne—R. and L. negative to C128, positive to C512. Bone-conduction—R. — 8 sec., L. — 10 sec. Gelle—R. and L. positive. Low tones—R. and L. C16 and C32 lost. High tones heard well. Acoumeter—R. 4½ in., L. 3 in. Voice—R. 1 ft. 7 in., L. 1 ft. 3 in. Whisper—*nil*. She was treated by inflation by her own doctor without result. In the summer of 1909 a submucous resection was performed with excellent result as to nasal breathing and colds, and this was followed by regular catheterisation and otomassage, which improved her hearing for voice 1 ft. R. and L. On September 16 she was found to have gone back to—voice, R. 29 in., L. 12 in., and fibrolysin was tried by hypodermic and Eustachian injection. Only a few injections were given by her own medical man (Dr. Lascelles, who took much trouble with the case), as the patient objected to the length of time the fluid remained in the Eustachian tubes. Improvement *nil*.

CASE VIII.—Female, aged thirty-five. Deafness four to five years, R. first affected. Worse past two years with colds and damp weather. Continuous rushing tinnitus R. and L. No paracusis Willisii. Was first conscious of her deafness after her first confinement at age of thirty. Has had four children, and was worse after each one. One brother deaf. R. and L. tympanic membranes slight indrawing, mallei mobile. Nose, throat, and post-nasal space *nil*. *Tests*: Rinne—R. and L. double negative. Bone-conduction—R. — 9 sec., L. — 13 sec. Gelle—R. and L. negative. High tones well heard, low tones—R. and L. C16 and C32 lost. Acoumeter—R. 12 ft., L. 1 ft. 1 in. Voice—R. 8 ft., L. 10 in. Whisper—R. 15 in., L. 21 in. From January 18 to February 2,

1909, she was treated regularly by catheterisation and otomassage, strychnine in increasing doses, nasal alkaline syringing, and counter-irritation. On January 30 her tests gave: voice—R. and L. 10 ft., whisper—R. and L. 3 ft., and aërial perception for C32 had returned. A bad attack of influenza occurred, and when she returned to me on October 4, 1909, her tests gave: Weber—L. positive; aconimeter—R. 8 ft., L. 46 in: voice—R. 17 in., L. 5 ft; whisper—R. 10 in., L. 5 in., and she had again lost aërial perception for C32. Fibrolysin was then tried, and she had thirty injections, with otomassage and occasional catheterisation. The first sixteen injections were partly hypodermic and partly by the Eustachian tubes, but, owing to the discomfort and increased deafness from the latter, they were discontinued. On February 28, 1910, her tests gave: Aconimeter—R. 5 ft., L. 46 in. Voice—R. 32 in., L. 57 in. Whisper—R. 12 in., L. 33 in. Weber not lateralised. Low tones—R. and L. C16 to C64 lost. The result here was doubtful, as it was impossible to eliminate the possible effects of the mechanical treatment. Moreover, she had again become pregnant.

CASE IX.—Female, aged thirty-two. First seen in 1897 for deafness with colds, and was treated by her own doctor by catheterisation, without result. When next seen (November 16, 1908) she had been married for seven years. Still deaf, with occasional tinnitus and paracusis Willisii. R. and L. tympanic membranes dull, thickened, and indrawn, mallei mobile. Nasal septum irregular, old chronic hypertrophic rhinitis passing to atrophy. Chronic pharyngitis. *Tests*: Rinne—R. and L. double negative. Bone-conduction—R. and L. + 7 sec. Gelle—R. and L. negative. High tones well heard. Low tones—R. and L. C16 to C128 lost. Aconimeter R. 13 in., L. 14 in. Voice—R. 15 in., L. 8 in. Whisper *nil*. She was treated from November 17 to December 23, 1908, by regular catheterisation and otomassage without appreciable result. From December 28 to March 29, 1909, she had thirty-three injections of fibrolysin (hypodermic only), with catheterisation and otomassage. Result *nil*.

CASE X.—Female, aged forty. Deaf, L. eleven to twelve years. R. slightly deaf past year. Singing tinnitus, continuous, but varying in intensity, worse in L. No paracusis Willisii. R. tympanic membrane dull and indrawn. L. tympanic membrane markedly indrawn and thickened. L. malleus restricted in movement. Chronic

pharyngitis. Nose *nil*. Tests: Weber—L. positive. Rinne—R. negative to C128, positive to C512. L. double negative. Bone-conduction—R. and L. + 10 sec. High tones heard well. Low tones—R. and L. C16 lost. Acommeter—R. 10 ft., L. 4 in. Voice—R. 10 ft., L. 2 in. Whisper—R. 19 in. L. *nil*. From June 15 to July 28 she was treated by regular catheterisation and otomassage, strychnine and an alkaline nasal douche. On the latter date she heard voice—R. 12 ft., L. 5 ft. Whisper—R. and L. 8 ft. Tinnitus less noticeable. On October 17 she had gone back to voice—R. 10 ft., L. 9 in. Whisper—R. 8 ft. L. *nil*. She then had forty injections of fibrolysin (hypodermic only) carried out by her own doctor, with otomassage. She improved to R. 12 ft., L. 17 in. Whisper—R. 12 ft., the left malleus moved normally, and the tinnitus had disappeared. When tested again on February 17, 1910, she heard acometer—R. 12 ft., L. 6 in.; voice—R. 12 ft., L. 21 in.; whisper—R. 10 ft.; L. *nil*, so that her improvement was maintained.

CASE XI.—Female, aged forty. Deaf two to three years, worse with colds. Continuous buzzing and whistling tinnitus. Paracusis Willisii. R. and L. tympanic membranes indrawn, with stretching of the posterior superior quadrant on the L. side. Mallei mobile. Chronic pharyngitis and rhinitis. Tests: Weber—R. positive. Rinne—R. and L. double negative. Bone-conduction—R. + 5 sec., L. + 9 sec. Low tones—R. C16 to C128 lost, L. C16 to C64 lost. Gelle—R. and L. negative. Acommeter—R. 18 in., L. 29 in. Voice—R. 7 in., L. 11 in. Whisper—*nil*. She was treated by regular catheterisation and oto-massage, with an alkaline nasal douche, from May 20 to June 12, 1908, with no practical result. On December 10 she again presented herself, when her tests gave: Acommeter—R. 14 in., L. 19 in. Voice—R. 12 in., L. 15 in. Whisper—R. and L. *nil*. Other tests as before. From that date until March 30 she had thirty injections of fibrolysin (hypodermic only), with catheterisation and otomassage. The catheterisation was discontinued after the first fifteen injections, but the otomassage was persisted with. On March 30 her hearing was: Acommeter—R. 3 ft. 6 in., L. 3 ft. 9 in. Voice—R. and L. 2 ft. 4 in. Whisper *nil*. The fibrolysin was then stopped, but otomassage continued for one month, when she stated that she could hear the clock and the household bells better, but her hearing had deteriorated for the voice to—R. 16 in., L. 2 ft.

CASE XII.—Female, aged fifty-four. Deaf over seventeen years, chiefly L. Pulsating tinnitus, constant, in L. only; causes insomnia. Paracusis Willisii. R. and L. tympanic membranes dull and indrawn. Mallei mobile. Chronic pharyngitis and rhinitis. *Tests*: Weber—L. positive. Rinne—R. positive, L. double negative. Bone-conduction—R. — 5 sec., L. + 10 sec. Gelle—R. positive, L. doubtful. High sounds—heard well. Low tones—R. C16 lost, L. C16 to C128 lost. Acoumeter—R. 10 ft., L. 28 in. Voice—R. and L. 10 ft. Whisper—R. 10 in., L. 14 in. She sought treatment rather for her tinnitus than for her deafness. Regular catheterisation and otomassage, with alkaline nasal douching, counter-irritation, and constitutional treatment were carried out from October until mid-December without any result. From May to July, 1909, she underwent a course of fibrolysin (thirty injections, hypodermic and by catheter), with the usual mechanical treatment. On July 10 her tests gave the same results as those previously noted. Tinnitus was in no way improved.

CASE XIII.—Female, aged forty-one. Deaf L. “several years.” Hissing and pulsating tinnitus. Worse with colds. No paracusis Willisii. Cerumen removed from L. L. tympanic membrane normal in texture and indrawn. R. tympanic membrane thickened and more indrawn than L. Mallei mobile. Septum deflected slightly to L., no obstruction. *Tests*: Weber—L. positive. Rinne—R. positive, L. double negative. Bone-conduction—R. + 7 sec., L. + 5 sec. Gelle—R. positive, L. negative. High tones heard well. Low tones—R. C16 lost, L. C16 to C64 lost. Acoumeter—R. 12 ft., L. 5 in. Voice—R. 12 ft., L. 20 in. Whisper—R. 12 ft., L. *nil*. For one month she was treated by catheterisation, otomassage, counter-irritation, nasal alkaline douche, and strychnine, but without improvement. She then had a full course of thirty injections (hypodermic) of fibrolysin, mechanical treatment by catheter and otomassage being continued. Improvement, either in hearing or tinnitus, *nil*.

CASE XIV.—Female, aged twenty-nine. Deaf thirteen years, worse past three to six months. “Rumbling” tinnitus. Began with colds. Paracusis Willisii. R. and L. tympanic membranes indrawn. Mallei somewhat restricted in movement. Chronic pharyngitis. No marked nasal obstruction, but remains of adenoids and adhesions in Rosenmüller’s fossæ. *Tests*: Weber not lateralised. Rinne—R. and L. double negative. Bone-conduction—R. and L.

— 12 sec. Gelle—R. and L. negative. Slight loss of high tones. Low tones lost R. and L. up to and including C1024. Acoumeter—R. 5 in., L. 3 in. Voice—only raised through a conversation tube. Whisper—*nil*. A bad prognosis was given and lip-reading advised, but as the patient begged for treatment the post-nasal adhesions were cleared and a course of catheter and otomassage tried for three weeks, without result. Thirty injections (hypodermic and by catheter) of fibrolysin were then administered, in addition to mechanical treatment. Results—*nil*. Restriction of malleolar movement in this case was uninfluenced.

CASE XV.—Male, aged fifty-two. Deaf twenty-five years, with tinnitus, which has lately become “unbearable.” Paracusis Willisii. Mother and brother deaf. R. and L. tympanic membranes indrawn. Mallei mobile. Irregular septum and chronic pharyngitis. *Tests*: Weber not lateralised. Rinne—R. and L. double negative. Bone-conduction—R. and L. + 7 sec. Gelle—R. and L. negative. High tones—slight loss. Low tones—R. C16 to C64 lost, L. C16 and C32 lost. Acoumeter—R. 3 in., L. 6 in. Voice—R. 8 in., L. 14 in. Whisper—*nil*. As this patient had already undergone several long courses of careful treatment at the hands of other specialists, he was, after having had the situation explained to him, at once put through a course of fibrolysin. He had thirty injections (hypodermic), and two injections by catheter. The latter were discontinued, as they made his tinnitus worse. Result at end of course and one month later, *nil*.

CASE XVI.—Female, aged thirty-four. Deaf, L. several years, R. six months; “rushing” tinnitus. L., no paracusis Willisii. R. and L. tympanic membranes dull and indrawn, mallei restricted in movement. Chronic rhinitis and pharyngitis. *Tests*: Weber—not lateralised. Rinne—R. negative to C128, positive to C512, L. double negative. Bone-conduction—R. and L.—5 sec. Gelle—R. and L. negative. High tones—heard well. Low tones—R. C16 and C64 lost, L. C16 to C128 lost. From June 24 to July 8, 1908, treatment by regular catheterisation and otomassage, with nasal douching, Mandl’s pigment and strychnine was carried out, without obtaining any improvement. From July 9 to 28, fourteen injections (hypodermic) of fibrolysin were given in addition, but as no alteration in either hearing or tinnitus occurred the patient abandoned further treatment.

CASE XVII.—Female, aged forty-nine. Deaf sixteen years, due

to colds. Paracusis Willisii. Occasional tinnitus. Sixteen years back "went the round of the aurists," but gave up treatment until one year ago, when she took a course of "high-frequency currents" under a notorious quack, which improved her subjective symptoms, probably by suggestion. She had been told of the "wonderful cures" effected by fibrolysin and insisted upon trying it. R. and L. tympanic membranes thickened and indrawn. Nasal septum irregular, but no obstruction. *Tests*: Rinne—R. and L. double negative. Bone-conduction—R. + 5 sec., L. — 8 sec. Gelle—R. and L. negative. High tones—heard well. Low tones—R. and L. C16 to C128 lost. Acoumeter—R. and L. concha. Voice—R. 4 in., L. 6 in. Whisper—*nil*. A course of thirty injections was carried out, with mechanical treatment by catheter and otomassage. Result—*nil*.

CASE XVIII.—Male, aged twenty. Deaf three years, from frequent colds. L. buzzing tinnitus. No paracusis Willisii. Mother deaf ("catarrhal"). R. and L. tympanic membranes indrawn and dull. Septum badly deflected to R. inferiorly and to L. superiorly, with pressure on enlarged middle turbinates. *Tests*: Weber—L. positive. Rinne—R. and L. double negative. Bone-conduction—R. and L. + 5 sec. Gelle—R. and L. posterior. High tones—well heard. Low tones—R. C16 to C64 lost. L. C16 to C12 lost. Acoumeter—R. 10 ft., L. 6 in. Voice—R. 27 in., L. 18 in. Whisper—R. 3 in., L. 1 in. Nasal operation, followed by a course of treatment, was the advice given, but, beyond using a nasal douche, the patient procrastinated. He returned two months later much worse, having had several bad colds. Hearing for the voice had decreased to R. 18 in., L. 10 in. He then submitted to a submucons resection, which greatly improved his nasal airway and tendency to colds. A month's treatment by catheter and otomassage failed, however, to improve the hearing, and as he was anxious to try fibrolysin he was put upon a course. After thirty hypodermic injections tests gave voice R. 20 in., L. 12 in.—a result which amounted practically to *nil*.

CASE XIX.—Male, aged forty-one; deaf twenty years, with attacks of "roaring" tinnitus and occasional vertigo of a general character. Paracusis Willisii. Had undergone numerous treatments by inflation, electricity, iodide of potassium, bromides, strychnine (hypodermically), etc., without result. R. and L. tympanic membranes indrawn and thickened, mallei immobile.

Nares narrow, inferior turbinals much scarred by galvano-cantery. *Tests*: Weber—not lateralised. Rinne—R. and L. double negative. Bone-conduction—R. and L. doubtful, repeated tests giving variable results. Gelle—R. negative, L. doubtful. High tones—slight loss. Low tones—R. and L. C16 to C128 lost. Acometer—R. 48 in., L. 7 in. Voice—R. 14 in., L. *nil*. Whisper—R. 7 in., L. *nil*. There was much difficulty in passing the catheter, especially on the right side, but the patient underwent a course of catheterisation and bougie, with otomassage, without appreciable result, and then decided to try a course of treatment at Mont Dore. Although better whilst at sea he was as deaf as ever at Mont Dore and on his return. After further courses of treatment he asked to be treated by fibrolysin, but after twenty injections, with persistent mechanical treatment, he abandoned it, result being *nil*.

CASE XX.—Male, aged twenty-four. Deaf seven years, for which he had seen four otologists of repute, had had two operations for adenoids, and had undergone several courses of inflation and otomassage with galvano-cantery to the throat and nose. Paracsis Willisii. Some tinnitus. Used to have frequent colds, during which he was worse. R. and L. tympanic membranes thickened and indrawn. Mallei mobile. Distinct adhesions in Rosenmüller's fossæ, nasal septum irregular and thick. *Tests*: Rinne—R. and L. double negative. Bone-conduction—R. + 12 sec., L. + 10 sec. Gelle—R. and L. negative. High tones—reduced. Low tones—R. and L. C16 to C128 lost. Acometer—R. 3 in., L. 1 in. Voice—R. 8 in., L. 5 in. Whisper *nil*. A bad prognosis was given, but at his own request the post-nasal adhesions were cleared, and a course of thirty injections (hypodermic and by catheter) of fibrolysin were given, with mechanical treatment by catheter and otomassage. The result was absolutely *nil*.

I have given these cases very fully, and it will be noted that II and V were instances of post-suppurative adhesions, VI was one of otosclerosis mixed with catarrh, whilst the remainder were cases of late stages of chronic middle-ear catarrh or of post-catarrhal adhesions. In every case other treatment had been tried before fibrolysin was used, whilst in a few the latter drug was employed at the patient's own request. In three cases improvement was noted (Cases II, V, X). The first of these was one of post-suppurative adhesions, whilst in Case IV, in which there were probably also fibrous

adhesions about the stapes, no amelioration took place. The first case in which I used this treatment was No. V, and the result was so surprising and so gratifying that I believed the remedy likely to prove valuable. A very interesting point in this case was that, after the fifteenth injection, the patient volunteered that his paracusis Willisii had disappeared. In this case, too, improvement was maintained. In the third case (Case X) also there was a continuance of the good result. In one case (Case VIII) the result was doubtful, as the occurrence of pregnancy may have prevented improvement. In none of the others was there any appreciable result, or, if a slight amelioration occurred, it was not maintained. In Case VI, one of mixed otosclerosis and catarrh, it is noteworthy that the characteristic promontorial blush disappeared, but this may have been coincidental, as I have noted this to happen in other otosclerotics in the course of the condition. In three cases (Cases X, XIV, and XIX) impairment of malleus mobility was noted; in only one of these (Case X) was this condition modified by the treatment.

As regards the question of tinnitus, this symptom was noted in seventeen of the twenty cases, and in one (Case XII) it was on account of its distressing nature that fibrolysin was tried, without result. In only two (Cases V and X) was the symptom improved by the treatment.

The injections were given in the arm, and although two cases stated that the administration was followed by pain, not of a lasting character, it was never attended by any ill-effects. In no case did I use "ear baths," as advocated by some other investigators, as they appear to have set up discharge in certain of the reported cases.

I would like to point out here that I am not absolutely satisfied in my own mind that the improvement in the three cases was due to the action of the fibrolysin, in spite of the fact that preliminary mechanical treatment had taken place. I have seen cases decidedly benefited by prolonged treatment, and therefore I do not think that this possibility can be excluded here.

I would further point out that, judging by what has been said as to the action of fibrolysin upon cicatrices, it should, from the swelling and œdema of the pathological fibrous tissue in the middle ear, cause the patient to be more deaf during its repeated administration. Such a result seems only logical. Tympanic membranes which are thickened by the development of pathological fibrosis ought to soften, become pink and œdematous, just as surface scars

are said to do under the influence of thiosinamin or fibrolysin. Throughout my cases I have constantly watched for such manifestations of the action of the drug, but in no case have I succeeded in detecting it. I feel, therefore, bound to think that, whatever may be its effects on cicatricial tissue elsewhere, it has no action upon pathological fibrosis in the middle ear occurring as the result of chronic catarrhal inflammation.

Finally, it will be noted that the stapes was fixed in a large proportion of my cases. I am aware that this condition is regarded by some investigators as a contra-indication for the use of fibrolysin, and rightly so when that fixation is due to new bone, as in otosclerosis, but it appears to me that when the ankylosis is a fibrous one, as it often is in old catarrhal cases, it is the very condition in which the treatment ought to do good, especially as it is one which is less likely to yield to other methods.

My results were, therefore, very disappointing, and I have now abandoned further trials. I think, however, that in a limited number of cases it might prove of use, but such cases would require to be very carefully selected. I cannot agree, from my own experiences, that fibrolysin merits the eulogies that some observers have lavished upon it.

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THE VISUAL FIELDS IN SPHENOID AND ETHMOID SINUSITIS.

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ALTHOUGH during the past twenty years numerous cases of disease in the nasal accessory sinuses associated with ocular symptoms have been recorded, it is only recently that any serious attention has been paid to the visual fields in this condition, and even at the present time the statements are very conflicting. With the object, therefore, of determining whether the visual fields are in any way affected in nasal sinusitis, and to note the frequency and character of such if present, I examined the ocular conditions of every patient who came for treatment of that affection to the Bristol Royal Infirmary and the Shrewsbury Eye, Ear and Throat Hospital during periods of eight and three months respectively. Excepting another case seen at the Bristol Eye Hospital, those reported below represent the visual fields in every sphenoid and posterior ethmoid sinusitis seen, and not as in selected cases.

The diagnosis of sphenoid and posterior ethmoid sinusitis is one of difficulty, and in most cases the differential diagnosis is impossible until after operation; therefore I have endeavoured to give briefly with each case the signs and symptoms upon which this was based. As the ethmoid labyrinth, however, is affected usually in conjunction with sphenoid sinusitis, the differential diagnosis is of less importance, particularly as most authorities agree that in operating upon the sphenoid sinus the ethmoid ought in addition to be dealt with, and also because Onodi (1) has demonstrated the many variations in the anatomical relations of the two sinuses to the optic nerves.

Most of these patients were submitted to skiagraphy by an expert radiographer, and according to Kuttner (2) this is of real diagnostic value in the hands of those devoting themselves to that particular subject. While not entirely assenting in this, I think without doubt it serves the purpose of demonstrating the presence or absence and topography of the sinuses under discussion.

The visual fields were examined, excepting where larger tests were necessary, with 5 mm. square white, red and green, and central scotoma by 1 mm. square red and green objects in every patient. The same colours were always used, and as far as possible

the lighting was made approximately the same. An examination was always made before any local nasal treatment was begun, and the subsequent investigations were made some days after any nasal treatment, lest reflex irritation of the nose might cause contraction. Examination was not made in females during menstruation, as Parsons (3) mentions this as a cause of peripheral narrowing of the fields.

CASE 1.—Mrs. F. K.—, aged twenty-six. Acute bilateral sphenoidal sinusitis. R.V. and L.V. no perception of light, the former with blocked central artery, the latter by intense hemorrhagic neuro-retinitis; recovery, R.V. $\frac{6}{12}$, L.V. $\frac{6}{12}$.

The right eye had rapidly become blind, temporal vision being affected first, the fundus showing blocked central artery with feeble collateral circulation, shortly followed by a similar attack in the left, but the fundus remained normal until ten days later, when intense hemorrhagic neuro-retinitis developed, both eyes being blind for two or three weeks, the right commencing to recover first.

Visual Fields.—Three weeks after onset vision had improved to H.M. in the temporal fields—bi-temporal hemianopsia. Eight weeks after onset (10 mm. objects), white bi-temporal contraction 40°, elsewhere only 20°. The arteries are better filled in right, and the neuritis subsiding in left: R.V. $\frac{6}{12}$, L.V. $\frac{1}{12}$. Four months after onset: Bi-temporal contraction 12°. R.V. $\frac{6}{12}$, L.V. $\frac{6}{12}$. One year after onset (5 mm. objects): Right and left—white bi-temporal contraction 20° to 30°, elsewhere 5°; red bi-temporal contraction 30° to 40°, elsewhere 10° to 20°. Green bi-temporal hemianopsia, but contraction elsewhere very marked. R.V. $\frac{6}{12}$, L.V. $\frac{6}{12}$; slight bilateral post-neuritic atrophy; the circulation is restored in the right central artery of the retina.

Treatment during inflammatory stages, mercurial inunctions and diaphoresis.

Diagnosis.—In the early stages of the affection pituitary enlargements were excluded by her good condition, normal menstruation, absence of change in face, feet and hands. Apart from the ocular signs and headache the nervous system was healthy, which also excluded intra-cranial growth. Nothing could be discovered to cause the symptoms, and owing to a completely negative history of nasal trouble and absence of discharge, sinusitis was not suspected. One year later when examined, definite evidence of sphenoidal sinusitis was found—engorgement of both inferior turbinals anteriorly but no pus; posteriorly, pus upon both middle turbinals and on the pharyngeal wall. Transillumination of frontal sinuses and antra perfect; skiagraphy showed very large sphenoidal sinusitis.

CASE 2.¹—Annie A.—, aged twenty-seven. Chronic bilateral sphenoidal sinusitis.

Bilateral choked discs present in right one year, left two years; reduction of R.V. to $\frac{6}{12}$ and L.V. to perception of light; recovery, R.V. $\frac{6}{12}$, L.V. $\frac{6}{12}$.

Visual Fields (before operation).—Right: White (5 mm. object) contracted in the inferior quadrant 50°, but elsewhere 20°; red is contracted similarly but more marked, and green is within the 5° circle (red and green 12.5 mm. objects); there is no central scotoma. Left (for 1200 mm. white object) is a small square island of vision extending from 30° to 80° in the temporal field.

¹ Fully reported in *Lancet*, 1910. Russ Wood and Wallis.

Both sphenoidal sinuses were opened, a fortnight after which R.V. $\frac{9}{12}$, L.V. $\frac{9}{12}$.

Visual Fields (5 mm. objects three months after operation).—Right: White shows 10° temporal contraction and the loss of a small sector inferiorly; red and green are now slightly more extensive than previously when tested by 12.5 mm., and much more relatively. Left (35.0 mm. white, formerly 120.0 mm.): The field of fixation, extending to 8° circle—within which is a central scotoma for green—is surrounded by a ring scotoma to 30° circle, but the peripheral field confines are almost full. R.V. $\frac{9}{12}$, L.V. $\frac{9}{12}$. Four months after operation—Right: All colours extended 5 to 10° (5 mm. objects). Left: 35.0 mm. white object. The peripheral field has encroached upon the ring scotoma 7° , and the central green scotoma has disappeared.

Diagnosis.—A long history of repeated sudden failures and recoveries of vision associated with frontal headache suggested a possible sinus origin; in the nose pus was only seen above the middle turbinals posteriorly, proving probable source of pus from one of the sinuses of the posterior group; the frontal sinuses and antra illuminated well. The absence of Bright's disease, syphilis, and plumbism, and healthy hæmopoietic and nervous systems, excluded these as possible causes of neuritis, and after pus had been removed from the sphenoidal sinuses by operation all the symptoms rapidly subsided.

CASE 3.—Joseph O——, aged twenty-three. Subacute bilateral sphenoidal sinusitis and extreme deflection of nasal septum.

Bilateral gross optic neuritis; marked hippus; R.V. — 3 = $\frac{9}{12}$, L.V. — 3 = $\frac{9}{12}$.

Visual Fields (before operation, 6.5 mm. objects).—Right: Concentric contraction for white 20° , and red 30° . Left: White and red contracted 45° in temporal fields, but 30° elsewhere. Bilateral absolute central scotoma for red and green.

Submucous resection was performed to permit of sphenoidal sinus operation later.

Visual Fields (fortnight after, 5 mm. objects).—Right: Slight improvement for white and red. Left: White and red extended 15° for 5 mm. objects, but relatively much more. Central scotoma has disappeared in both.

Sore throat and rise of temperature supervening the day after the septal operation with presence of a type of Klebs-Loeffler bacillus rendered operation upon the sinuses at an early date inadvisable. The submucous resection and bleeding, relieving the marked congestion and rhinitis, converted a partially closed to an open sinusitis, with consequent relief of symptoms.

Diagnosis.—The history of severe frontal headache, prolonged nasal obstruction with formation of crusts, which were also seen together with pus on the roof of the post-nasal space, suggested sinusitis of the posterior group.

Submucous resection, relieving the congestion, was followed by great increase of pus above the middle turbinals posteriorly. Skiagraphy showed moderately large sphenoidal sinuses. Optic neuritis of nervous and toxic origin was excluded.

CASE 4.—Joseph H——, aged twenty-two. Probable bilateral chronic sphenoidal and posterior ethmoidal sinusitis; duration two years.

R.V. and L.V. $\frac{6}{12}$; bilateral central guttate choroiditis.

Visual Fields.—In both eyes the corresponding colours are equally and symmetrically affected—white contracted 5° in temporal and 45° in superior quadrants; red contracted superiorly 40° and inferiorly 45° ; green is entirely within the 20° circles, but more contracted superiorly and inferiorly. Large relative scotomata in each eye for red and green.

No operative treatment was permitted and patient lost sight of.

Diagnosis.—The long history of nasal obstruction and post-nasal discharge, together with pale engorged middle turbinals, and pus in the right olfactory cleft, and also upon the middle turbinals posteriorly—which rapidly reappeared after removal by Fränkel's syringe—suggested involvement of ethmoid labyrinth as well as of sphenoidal sinuses.

Failing vision dated shortly after onset of nasal symptoms; syphilis was excluded, and no other cause could be found for the choroiditis.

CASE 5.—Elsie B—, aged nineteen. Chronic bilateral sphenoidal sinusitis and probable ethmoiditis; duration three years.

Considerable bilateral primary optic atrophy. R.V. and L.V. $\frac{6}{12}$.

Visual Fields (before operation).—Right and left: White, red and green show temporal contraction of 55° , but elsewhere 25° to 35° .

The symptoms were relieved by drainage and prolonged after-treatment of the sphenoidal sinuses in this and Case 6, but no cessation of suppuration followed, and the visual fields (three months after) had not improved in either patient.

Diagnosis.—A history of bilateral nasal discharge with severe frontal headache, which became worse when the discharge lessened, and objectively much pus in the middle and superior meatus anteriorly on both sides and upon the middle turbinals and roof of post-nasal space made the diagnosis of sinusitis probable. Pus and polypi were everted from the sphenoidal sinuses, but suppuration continued, evidently from the ethmoid labyrinth, as the frontal sinuses and antra were repeatedly washed out with negative results. Skiagraphy showed very large sphenoidal and healthy frontal sinuses.

No other cause could be discovered to cause partial atrophy in this or Case 6.

CASE 6.—William J—, aged twenty-two. Chronic left and probable right sphenoidal sinusitis; four years' duration.

Slight bilateral primary optic atrophy. R.V. and L.V. $\frac{6}{12}$.

Visual Fields (before operation).—Bilateral symmetrical and almost concentric contraction for all colours: White 20° , red and green 25° to 30° , slightly more marked in temporal fields.

Diagnosis.—There had been left-sided nasal discharge and obstruction for many years. Anteriorly pus was present in the left superior and middle meatus, and posteriorly crusts, and pus, which rapidly re-formed, after removal, upon both middle turbinals. The left sphenoidal sinus was opened, and pus was syringed out through the opening for months afterwards. The antra were washed out with negative results. Skiagraphy of the sinuses showed the frontal healthy, posterior ethmoid large, and sphenoid moderate in size.

CASE 7.—Mary P—, aged eighteen. Subacute right sphenoidal sinusitis; duration nine months.

Asthenopia; R.V. and L.V. $\frac{6}{12}$; bilateral, fine hazy neuritis.

Visual Fields (before operation).—Right: White, red, and green show temporal contraction of 25° , 35° , and 40° respectively; elsewhere white 15° , red and green 25° . Left: White, red, and green contracted 50° in temporal quadrants; elsewhere 20° to 30° .

After the sphenoidal sinuses were opened the intense headache and all ocular and nasal symptoms subsided. R.V. and L.V. $\frac{6}{12}$.

Visual Fields (three weeks later) were extended 10° to 20° in each eye.

Diagnosis.—This patient had suffered severe constant right temporal and frontal headache for one year, unrelieved by the removal of the teeth and medicinal treatment. Because of the severe post-ocular pain, bilateral fine hazy optic neuritis, and the presence of oedematous inferior turbinates, the sphenoidal sinuses were explored and found to contain a little mucoid material. The diagnosis was practically confirmed by the rapidity of subsidence of neuritis, improvement in visual acuity and fields. Pain had not recurred when the patient was seen two months later. Skiagraphy of the sinuses shows very small sphenoid and frontal healthy.

CASE 8.—Mrs. M. D—, aged forty-two. Chronic bilateral sphenoidal and ethmoidal sinusitis; duration several years.

Syphilitic choroido-retinitis present in both eyes, which entirely modified the visual fields.

CASE 9.—Thurza S—, aged twenty-eight. Chronic bilateral sphenoidal sinusitis; eight years' duration.

R.V. and L.V. $\frac{2}{6}$; fundi healthy.

Visual Fields (before operation).—Right: White concentrically contracted 15° , red 45° . Left: Almost concentric contraction for white 20° and red 30° , but slightly more marked in the temporal quadrants.

Opening the affected sinuses and very prolonged after-treatment cured the nasal suppuration and symptoms.

Visual fields examined on several occasions became progressively more limited, and five months after operation were much more contracted than before treatment for all colours, probably due to retinal fatigue resulting from mitral incompetence and severe post-operative debility. R.V. and L.V. $\frac{2}{6}$.

Diagnosis.—The history of post-ocular pain with severe frontal headache, complete nasal obstruction and discharge during eight years suggested a probable sinus origin. Anteriorly on both sides much pus and polypi with oedema of middle turbinates, and posteriorly pus upon and above both middle turbinates; some oedema of forehead. Skiagraphy indefinite. The antral and frontal sinuses were explored and found healthy; both sphenoidal sinuses were opened and polypi removed, which confirmed the diagnosis.

CASE 10.—Mrs. Alice S—, aged thirty-three. Chronic bilateral sphenoidal and posterior ethmoidal sinusitis; ten years' duration. R.V. and L.V. $\frac{2}{6}$; fundi healthy; hyperphoria 10° prism.

Visual Fields (before operation).—Right and left: White concentric contraction 5° to 10° , green 35° to 40° .

A fortnight after curettage of affected sinuses the headache, nasal suppuration, and symptoms were all relieved.

Visual Fields (a fortnight and a month after operation).—Right and left: White full and green, only contracted 5° to 15° . Hyperphoria is still present.

Diagnosis.—Severe post-ocular pain and frontal headache during ten years. Anteriorly, considerable atrophy of mucosa, but no pus or crusts, but, posteriorly, blood-stained pus upon pharyngeal wall and roof of post-nasal space. Frontal and antral sinuses illuminate well. Skiagraphy shows healthy frontal and very large sphenoidal sinuses. Pus and polypi were curetted from sphenoidal and ethmoidal cells.

CASE 11.—Mary R—, aged twenty-nine. Probable chronic bilateral sphenoidal and ethmoidal sinusitis three years' duration.

R.V. and L.V. $\frac{2}{6}$; asthenopia; fundi healthy.

Visual Fields (before treatment).—White normal in both; green contracted in right and left temporal portions 30°, but elsewhere 40°.

After six weeks' administration of small doses of potassium iodide and antimony the headache and nasal discharge were greatly alleviated, though not cured. R.V. and L.V. $\frac{5}{6}$; asthenopia cured; patient lost sight of.

Visual Fields (after treatment).—Right and left: White are full, green are extended 10° in the right temporal fields, and 5° elsewhere.

Diagnosis.—Constant frontal headache, without tenderness, nasal discharge, and frequent pain in the right ear during three years. Tenderness on palpating the globes; anteriorly both middle and inferior turbinals oedematous, and pus far back in the superior meatus; naso-pharynx full of pus, which, after removal, rapidly re-formed above the middle turbinals, indicating probable ethmoiditis in addition to sphenoidal sinusitis. Frontal and antral sinuses illuminate well.

Laurens (4), in 1895, in a collective article of all the ocular signs and symptoms in accessory sinus disease, stated that affections of the visual fields have been observed, but are rare. Onodi, in his exhaustive work on the accessory sinuses, states that "Hinkel treated twenty cases of sphenoidal suppuration without finding anything abnormal in the visual fields. . . . Contrary to the findings of Grünwald, Ziem, Bryan, Kuhnt and Berger, Henrici and Häffner in thirty-six cases of accessory sinus disease found a normal visual field. These facts are to be explained, . . . by the varying relation of accessory sinuses and optic nerves. . . . There are two factors that help in the limitation of accessory sinus disease, and prevent it from spreading to the optic nerves: the nerves may come into no relation with the sphenoidal sinuses or ethmoid cells, and the wall of the sphenoid may be very thick." Whilst agreeing with Onodi that the varying relations of accessory sinuses to the nerves and the thickness of the sinus walls are factors to be considered in the production of field affections, I cannot concur in his anatomical explanation as the cause of these conflicting statements. It seems scarcely within the bounds of possibility that certain anatomical relations of the posterior sinuses should always occur in the patients of those observers who have recorded field affections, and that certain other anatomical relations should always occur in the patients of those who have not found the fields affected. I believe the chief explanation is to be found in the character of the sinus inflammation, as will be pointed out later.

Bireh-Herschfeld (5) observed central scotoma in three cases of sphenoidal sinus suppuration, and believes that the papillo-macular bundle is always involved firstly and that peripheral field contractions are secondary; Berger (6), on the other hand, lays stress on the concentric contraction of the visual field as a sign of impli-

cation of the optic nerves. In these eleven cases, excluding Case 8, in which there is syphilitic choroido-retinitis, central scotoma occurred twice, and peripheral contraction in every case.

Contraction, either general (*i. e.* of the whole field but not necessarily concentric) or concentric, was present in every patient, that for red and green being more marked than white, and green being by far the most affected (excepting in Cases 5 and 7, where the contractions for all colours were proportional). This greater contraction for green is the more remarkable, because when the visual fields of normal individuals were tested with these same coloured objects, that for green was as extensive as that for red, owing to the green being tinged with yellow; therefore white and green accentuate field affections and give the best comparison. In Case 11 the fields for white were full but those for green showed extreme contraction; in Case 6 there was partial reversal of colours in a young healthy boy without any hysterical stigmata, and appeared to be due to colour perception defect; I have noted both of these signs in anterior sinnsitis.

In addition to general, eight of these cases showed marked temporal contraction, five of which were bi-temporal and one a bi-temporal hemianopsia; this latter symptom is evidently not common, for I have only seen two cases reported as occurring in sphenoidal sinnsitis—one by Jameson Evans (7), and the other by Redlich (8). Glegg and Hay (9) have reported a case with pronounced bi-temporal contraction.

In two of the cases considerable altitudinal contraction was present both in the superior and inferior fields. This form of contraction appears to occur as frequently in the anterior group of sinnses as the posterior. Marked temporal and particularly bi-temporal contraction is common in the posterior group, but I have only seen one example of this in the anterior, that being a very extensive frontal sinnsitis.

Island vision and ring scotoma occurred in Case 2, a severe papilloedema, which during the worst stage of visual defect showed only an island of vision in the temporal field, but during recovery developed into a complete ring scotoma.

Central scotoma occurred four times, which in Cases 4 and 8 was due to the associated choroidal condition, but in Cases 2 and 3 it was caused by involvement of the papillo-macular bundle. In Case 2 (chronic sphenoidal sinnsitis) it was a passing phase in the ring scotoma, and was to be expected with so serious involvement of the nerve, but in Case 3 it was due to acute sinnsitis.

Therefore, in chronic sinusitis of the posterior group temporal contraction is the characteristic symptom, whereas in acute posterior sinusitis the characteristic feature would appear to be central scotoma.

Ætiology of Field Affections.—Ophthalmoscopic changes are a far more common symptom in posterior sinusitis than in the anterior, as is to be expected from the close proximity of the nerve to these cavities. Cases 9, 10 and 11 were chronic sinus suppurations showing no changes in the fundi, but marked contraction in the temporal portion of the visual fields. This is explained by the assumption that the optic nerves are directly involved by a toxic substance which has soaked through into the optic canal and orbit from the sinuses. In chronic sinus suppuration the walls are thin or deliscent and the mucosa atrophied, consequently its power of preventing the passage of toxic substances is greatly diminished. It should be remembered that the nasal aspects of the optic nerves are in contact with practically the whole length of the lateral walls of the posterior sinuses, and therefore it is obvious that if the optic nerves be involved the temporal field will be the first affected. The papillo-macular bundle, being central in position, is protected by the outer fibres, and hence scotoma is not seen in chronic cases.

In a series of anterior sinusitis cases which I investigated marked temporal limitation was the exception, and more or less concentric contraction the rule. This may be accounted for on the above hypothesis by assuming that further forward in the orbit (opposite the anterior group of sinuses) the toxic substance becomes more diffused, and hence the circumferential fibres of the nerves are equally affected.

Whilst making these investigations it was suggested that the nature of the field affections observed, in cases without ophthalmoscopic signs, was reflex from nasal irritation. Considering the numerous reflex ocular symptoms that result in nasal disease this appeared very probable; but I could not detect any field affection in mucocœles of the frontal and anterior ethmoidal sinuses, a chronic antral sinusitis (in a young girl), nor in several cases of rhinitis, and of deflected nasal septa. This is probably due to the fact that mucocœles are sterile and presumably free from toxic substances; the antra in children have very thick walls which would hinder the passage of such materials, and in rhinitis very free drainage is secured, yet in these cases there was of necessity severe nasal irritation. Hence, the field contractions described in this paper could not be reflex in origin, but are due to direct

poisoning of the nerve-fibres. Where the diseased sinuses are unilateral but both fields affected, *e. g.* Case 7, the explanation is to be found in the sinus being in relation to both optic nerves (Onodi). There can be little doubt that a considerable quantity of toxic muco-pus is produced within the suppurating sinuses, and, on account of their anatomical formations, it tends to accumulate.

Peripheral contraction also occurs when neuritis has resulted from sinus disease, and the latter was present in Cases 1 and 3 as neuro-retinitis, Case 2 as papillœdema, and Case 7 as "fine" or "hazy" neuritis. In the first two groups field contraction probably resulted from pressure upon the nerve within the optic canal by inflammatory œdema set up by the poisonous substances. In the "fine" neuritis the ophthalmoscopic appearance suggested to Mr. Richardson Cross, who kindly examined the patient with me, a condition of *hydrops vaginæ nervi optici*, which probably resulted from irritation of the nerve-sheath endothelium by the toxic substance, causing pressure upon the nerve-fibres with consequent field contraction. This condition of *hydrops* is presumably an early stage in the more severe forms of neuritis. It is likely that the two cases—Cases 5 and 6—showing slight primary atrophy (primary so far as the ophthalmoscopic appearance) had resulted from a previous hazy neuritis from the same cause.

Therefore it is evident that posterior sinusitis causes visual field contractions without fundus changes, with fine forms of neuritis and with gross forms of neuritis; these three are probably merely degrees of the same pathological change, and an indication of the amount of toxic material passing through the bony wall.

In this series "gross" forms of optic neuritis only occurred in acute and subacute sinus suppurations, and the "fine neuritis" in chronic sinusitis. Assuming that in acute cases the toxins are carried by the blood-stream, and by permeation in chronic cases, then in the former much larger doses would continually reach the optic nerve and surrounding tissues with resulting inflammatory œdema than in the latter. Such an hypothesis for acute suppuration is supported by the often rapid onset of neuritis and central scotoma, together with their quick disappearance when the cause is effectually treated. The ethmoid veins freely communicate between the sinus mucosa and the orbits; probably also vessels connect the mucous membrane of the posterior sinuses with the periosteum of the optic canal, particularly when the bone is deliscent, as so frequently occurs. The mucous membrane in acute cases, being hyperæmic, further assists in this process.

Acute sinus suppuration is probably characterised by central scotoma, due to papillo-macular involvement, and it has frequently been observed in such cases. It only occurs in the one acute sinusitis of this series; and in chronic sinus affections of the anterior group I have never noted it. Onodi and Birch-Hirschfeld (10) state that central scotoma results from pressure upon the optic nerve causing damage to the most delicate fibres—the axial bundle. This was evidently the cause in Case 3, and is also well illustrated in a case of sphenoidal sinusitis, quoted by Fuchs (11), in which he detected a minute central scotoma, although the peripheral field was normal. Pressure alone does not always cause central scotoma, for in Case 2 the patient's right optic nerve was affected by severe papillœdema, but central scotoma was not present. It is therefore possible that a local toxæmia is, in part, the cause of that condition.

Thus, if central scotoma only occurs in acute cases, it may be readily overlooked, unless the patients be seen early and the central vision be carefully tested, because the vision in these cases is often rapidly and completely lost. I have demonstrated that chronic cases show peripheral contraction, acute cases central scotoma, and cannot help thinking that the divergent views held by various writers as to the presence or absence of field affections are due to the perimetric observations being made in undifferentiated (*i. e.* acute and chronic) cases. This seems to me a more reasonable explanation than that of the anatomical variations of the sinuses to the nerves invoked by Onodi.

Ring Scotoma and Island Field of Vision.—I have not found any reference to sphenoidal sinusitis as a cause of these conditions, though from the conversion of the island field of vision in Case 2 to a ring scotoma *pari passu* with the recovery of the patient there can be no doubt as to their causal relation.

Effect of Treatment and Prognosis.—In acute and subacute sinusitis, and particularly where active nerve changes are present, the effect of appropriate treatment has markedly beneficial results upon the visual fields. On the other hand, in chronic cases, which usually show no fundal changes, the visual fields do not greatly improve. We can assume with great probability that in chronic suppurations the poisoning has been going on for a long time, causing permanent damage to the nerve, and in acute sinusitis sufficient time does not elapse for this to take place. Only two patients, however, in this series have developed signs of primary atrophy.

The fields may be, and frequently are, further narrowed after operation upon the sinuses, but this only lasts a few days, and quickly passes off, being evidently due to passive oedema causing pressure upon the nerve.

Conclusions.—Peripheral field contraction was present in every case, and marked temporal and particularly bi-temporal contraction and bi-temporal hemianopsia is characteristic of chronic sinusitis of the posterior group. This is due, in the absence of ophthalmoscopic changes, to the direct action of toxins upon the nerve by contact, and is not of reflex origin.

Peripheral contraction in the presence of gross neuritis is due to pressure from inflammatory oedema within the optic canal, and in "fine" neuritis to pressure from hydrops vaginae nervi optici, both resulting from the action of toxins.

Peripheral field contractions without fundal changes with "fine" neuritis and with gross neuritis in sinus affections are but degrees of the same pathological process, and indicate the amount of poison which has reached the nerve.

Central scotoma probably only occurs in acute sinusitis, and results from pressure, and possibly partly from the local action of toxins.

The differences in the ocular symptoms of acute and chronic sinusitis depend upon the amounts of toxin reaching the nerve; in the latter it soaks through the sinus walls slowly in small quantities; in the former carried more rapidly, and in larger measure by the vessels.

The result of treatment of the diseased sinuses on the contracted fields is most beneficial when the suppurations are acute, and when optic neuritis is present.

Operative treatment of the sinuses may cause temporary diminution of the visual fields.

Ring scotoma may result from sphenoidal sinusitis.

The perimeter should always be used in suspected sinusitis. Field changes help to confirm, and their absence to negative, the diagnosis; the presence of central scotoma calls for more active treatment.

White and green are the best test objects, the field for green being generally much more contracted than the field for white.

My best thanks are due to Mr. F. R. Cross, Dr. P. Watson Williams, and Mr. Russ Wood for permission to publish these cases, as well as for their kind criticism.

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REPORT OF A CASE OF THROMBOSIS OF THE LATERAL SINUS EXHIBITING SYMPTOMS OF CEREBELLAR ABSCESS; OPERATION; RECOVERY.

BY J. WALKER WOOD, L.R.C.P.&S. EDIN.,

Formerly House-Surgeon, Central London Throat and Ear Hospital.

J. P.—, male, aged fifteen. This patient was sent by Dr. Alston to the Central London Throat and Ear Hospital on January 21, 1910, to be placed under the care of Dr. Abercrombie. The following history of his illness was obtained. Fourteen days previously he complained of a sudden pain in his left ear. The onset of the pain was accompanied by shivering and nausea, but no vomiting. Between Saturday, January 8, and Thursday, January 13, he had six rigors. Ear discharge was denied, but his mother stated that he had suffered from giddiness and headache for over six months.

On Admission.—He looked very ill. The temperature was 98° F., the pulse 94, and the respirations 22. The bowels were constipated; headache was complained of, severe and constant, and referred to the vertex and the occiput, more especially on the left side of the head.

The pain was occipital. There was marked tenderness over the site of the mastoid emissary vein, but no swelling or redness. The pain radiated down the left side of the neck, and he had slight tenderness along the line of the internal jugular vein.

Giddiness.—He had extreme giddiness of the rotatory type,

which was as marked when the eyes were closed as when they were open. Objects appeared to rotate from right to left, in the lateral plane. He also had slow, spontaneous nystagmus on looking to the extreme right.

The patient was too ill to rotate or to apply other nystagmus tests, except the fistula nystagmus test, which was negative. Rombergism was marked, the tendency being to fall to the right side.

Eyes.—There was paresis of the left external rectus and slight ptosis; diplopia, spontaneous nystagmus to the right, and photophobia. The pupils reacted to light and accommodation. Optic discs: Some swelling and rolling of the edges of the disc, which were not distinct, and appeared to be in a "fog." The veins were markedly congested and tortuous.

Reflexes.—Knee-jerks exaggerated—mostly on the left side. Ankle-clonus, left side only. Babinski plantar flexion both sides. Kernig's sign absent.

Dynamometer.—Right hand 50, left hand 56; right hand weaker than left. He is a right-handed boy.

General Condition.—No patches of anaesthesia or paralysis. He lay on the left side principally. Somnolence and aprosexia. No local swelling or redness of the mastoid process.

Right Membrana Tympani: Normal.

Left Membrana Tympani: Large perforation involving practically the whole of the anterior inferior quadrant. Meatus filled with inspissated pus. *Tuning-fork tests:* C. 256. Meatus — 40". Mastoid + 12". Weber, referred to left side. Rinne negative. High-pitched tinnitus in the right ear. His mother stated that he had been deaf for some considerable time.

Diagnosis.—Chronic suppuration of the left middle ear with thrombosis of the lateral sinus and signs of labyrinthine irritation.

January 21: Operation; Radical Mastoid (Left).—In the absence of Dr. Abercrombie, Dr. Dundas Grant performed the first operation. Usual incision behind ear. Bone exposed and outer bony wall of antrum removed. The mastoid process was found to be of the cellular type and in a state of acute inflammation, bleeding very freely. The antrum contained granulations and some sticky, gluey-like mucus, but no pus. Whilst removing the outer attic wall there was considerable hæmorrhage from a small vein, which seemed to indicate some blockage in the bulb. The bridge and ossicles were removed. The whole of the mastoid cells down to the tip were opened up,

but no pus could be found. The post-auricular incision was then continued backwards over the occipital region, and a large trephine opening made over the lateral sinus, which was exposed. The sinus was then found to be completely thrombosed with apparently a pure, healthy blood-clot. The clot was curetted away until fluid blood was reached. The upper and lower ends of the sinus were plugged with iodoform gauze. Occipital incision closed, but post-auricular incision left open, the whole wound being plugged with plain aseptic gauze.

Later, 5 p.m.—Half an hour after the operation patient had a shivering fit lasting ten minutes. Temperature taken, but no rise recorded.

January 22.—General condition shows little improvement. Giddiness is very great, and is increased by the slightest movement. Complains of severe headache, and does not like to be spoken to or moved. Marked pain and tenderness over the upper end of the internal jugular vein, and also down the muscles of the back of the neck. No head-retraction. Kernig's sign not present. Tâche cérébrale not present. The nystagmus has now become more marked on looking to the left side (*i.e.* the same side). Knee-jerks sluggish, the left one being almost absent. No ankle-clonus. Pupils dilated. Paresis of external rectus continues. Marked photophobia.

Vomiting.—Patient has vomited several times. The sickness is of the typical pumping character, unlike post-anæsthetic sickness. Temperature subnormal. No more rigors. Pulse 80.

On the foregoing symptoms and history Dr. Abercrombie decided to explore the cerebellum.

Second Operation: January 22, 1910. The operation was performed by Dr. Abercrombie, assisted by Drs. Dundas Grant and Walker Wood.

Old wound re-opened. Lateral sinus followed back almost to the torcular Herophili. The thrombus was completely removed with the curette, and the sinus was then plugged. The posterior fossa was explored through the posterior membranous wall of the sinus. On incising the dura there was a gush of clear serous fluid: the cerebellum was then exposed and probed with the "pus seeker," but no abscess located. Careful inspection of the external semi-circular canal failed to reveal any sign of caries or fistula. A second incision was made vertically upwards, and a second trephine opening made directly above the meatus. The temporo-sphenoidal lobe of the brain was explored without success, its exposure being

accompanied by a similar gush as that on exposing the cerebellum. During this part of the operation there was a considerable rush of cerebro-spinal fluid from the lateral ventricle of the brain. Before leaving the operating table lumbar puncture was carried out by Dr. Walker Wood.

PATHOLOGICAL REPORTS BY DR. WYATT WINGRAVE.

- (1) *Pus from meatus*: Staphylococcus; diphtheroid bacilli.
- (2) *Lumbar puncture fluid*: Amount 14 c.c.; cloudy, sanguineous, contained leucocytes and erythrocytes. No bacteria found. *Culture*: *Staphylococcus albus*.
- (3) *Fluid from middle fossa*: Leucocytes and erythrocytes. Endothelium. No bacteria. *Culture*: *Staphylococcus albus*.
- (4) *Clot from lateral sinus*: Staphylococcus.

January 23.—Wound dressed; very dry; no discharge. General condition has improved greatly. Complains mostly of sickness. Giddiness less. No ankle-clonus; knee-jerks present. Left hand-grip much weaker than right. Can perform associated movements quite well.

January 24.—Marked and great improvement. No headache, giddiness, or vomiting. The movements of the left eye were normal. No diplopia or nystagmus. No ankle-clonus. Knee-jerks still absent. Patient is much more intelligent and bright. Wound dressed; very little discharge.

January 24 to February 14.—Steady and marked improvement. Wound dressed daily and plugged with iodoform ribbon-gauze. To-day he developed more cranial symptoms. Headache and giddiness. Slight nystagmus to the left.

February 14.—The symptoms disappeared again after the administration of 5 gr. of calomel.

March 2.—Patient was unfortunate enough to contract scarlet fever, and had to be sent away to Metropolitan Asylums Hospital. The post-auricular wound was practically healed; still a little discharge from meatus. No headache. Hearing good.

June, 1910.—Wound healed; no discharge. Hears quite well.

REMARKS.

The diagnosis of cerebellar abscess is always attended with considerable difficulty. In the case described above there could be no doubt as to the diagnosis of thrombosis of the lateral sinus; but, in addition, there were signs and symptoms which more than

suggested some cerebral or cerebellar lesion. The symptoms at the time of the first operation were compatible with a labyrinthine lesion, such as a serous labyrinthitis, but later they were more suggestive of some cerebellar implication. These latter symptoms were headache, sickness, and giddiness. Optic neuritis, which is found in about 50 per cent. of cases of cerebellar abscess, was also present. The change in the direction of the nystagmus was of great importance in evidence of cerebellar abscess. According to Neumann, when nystagmus, which was previously more marked on turning the eyes towards the sound ear, changes, and becomes greater on looking towards the diseased side, abscess in the cerebellum is very probably present.¹ The temperature and pulse were not reduced to the extent that is usual in brain abscess, probably on account of the thrombosis. Cerebral symptoms were evident in the dull, morose, sleepy condition of the patient. His position in bed was rather characteristic of cerebellar abscess. He was curled up in bed with his head thrown back, always lying on the affected side, as he said "he was not so giddy then." Other signs in favour of an abscess in the cerebellum were the weakness of the hand-grip on the affected side, and the inability to perform associated movements—ataxia, without the loss of the sense of position. Paresis of the oculo-motor (although not infrequently observed in cases of thrombosis of the lateral sinus) was more suggestive of an abscess in the temporo-sphenoidal lobe. I believe symptoms of cerebellar irritation are frequently found in thrombosis cases, and may be explained by an increase in cerebro-spinal fluid pressure in the posterior fossa. In this case all the symptoms of which the boy complained were relieved by opening his posterior and middle fossæ, and by lumbar puncture, probably in consequence of the relief of tension thus brought about.

I desire to express my indebtedness to Dr. Peter H. Abercrombie and Dr. Alston, who have kindly given me permission to publish this case.

THE ROYAL SOCIETY OF MEDICINE—OTOLOGICAL AND LARYNGOLOGICAL SECTIONS.

THE combined annual dinner of the above sections will be held at Oddenino's Imperial Restaurant, Regent Street, W., on Friday, May 19th, at 7.15 for 7.30 p.m. Those who have not already received invitations are requested to communicate with the secretaries, Messrs. H. J. Marriage and Sydney R. Scott.

¹ Gray, "Diseases of the Ear," 1910, p. 258.

SOCIETIES' PROCEEDINGS.

ROYAL SOCIETY OF MEDICINE—OTOLOGICAL
SECTION.

March 17, 1911.

MR. A. H. CHEATLE, *President, in the Chair.*

DISCUSSION ON TRAUMA IN RELATION TO OTOTOLOGY.

INJURIES OF THE EXTERNAL AND MIDDLE EAR.

BY W. MILLIGAN, M.D.

(Abstract.)

Injuries of the Auricle.—Cases of complete avulsion of the auricle from injury, and of complete amputation from duelling, have been recorded (Rauch, Politzer) in which immediate reposition and suture of the severed organ was followed by rapid union and healing. In cases of extensive injury to the auricle and cartilaginous meatus care should be exercised to prevent contraction or complete occlusion of the meatus from cicatricial stenosis. An interesting and important point in connection with incised wounds of the auricle is the occasional malignant degeneration of the resulting scar-tissue. Of this I have seen two instances, the original injury in both cases being due to an incised wound almost dividing the auricle into two portions.

Othæmatoma.—The auricular perichondrium is formed of a dense connective tissue, continuous on the one hand with the subepithelial reticular tissue, and on the other with the stroma of the cartilaginous matrix. In places it is continuous, with strands of fibrous tissue which actually pierce the cartilage, and along which small arteries and nerves run. Hence the frequency with which effusion is found upon both sides of the cartilage. The extravasated blood is, however, more frequently found upon one side, most usually the anterior surface, where it tears up the loose connective tissue which separates the skin from the underlying cartilage, and which in reality is a part of the perichondrium.

Deformities of the Auricle from Self-mutilation.—The custom of piercing or boring the lobule for the introduction of ear-rings or other ornaments leads at times to the formation of fibrous tumours, often of considerable size, or keloid scars. It is a custom adopted by almost all the races of mankind. Amongst the indigenous African, American, Australian, and Indian tribes extraordinary and weird ornaments are worn, the day for the performance of the operation of boring the ear being kept as a festival. As the result of wearing heavy ear ornaments the lobule is at times completely torn through, producing the unsightly deformity known as "cleft lobule"—the treatment of which consists in paring the opposed epithelial surfaces and uniting them accurately with horse-hair—or becomes so elongated as to produce a most unsightly deformity.

[Dr. Milligan illustrated this part of his paper by throwing on the screen a selection of photographs showing the different varieties of ear ornaments in use throughout the world.]

Foreign Bodies in the Ear.—Speaking generally, a foreign body rarely, unless actually forced in, passes beyond the junction of the cartilaginous with the bony portion of the meatus. Its removal is seldom a matter of urgency. Experience shows that it is infinitely better and safer to wait and perform extraction under suitable conditions rather than to attempt it with an inadequate light and an unsuitable armamentarium. Many cases of foreign bodies remaining in the meatus for years without injury to the ear have been recorded. Thus Winterbottom relates the case of a cherry-stone in the ear for sixty years, and I have myself recorded two cases where in one the foreign body, a boot-button, remained in the ear for thirty-seven years, and in the other a slate pencil for thirty years, without doing any damage whatever. In both cases it was known to the patient that there was a foreign body in the ear. The most untoward results at times follow unskillful efforts of extraction. In a case coming under my own notice the membrana tympani and the malleus and incus were removed in the endeavour to extract some molten lead which was supposed to have lodged in the ear; in addition the Fallopian aqueduct was so injured that permanent facial paralysis ensued. When the use of the syringe in the hands of the family practitioner fails to dislodge the foreign body the case should, in my opinion, be referred to an expert.

Rupture of membrana tympani may be produced by direct or indirect violence. Injury from direct violence, such as from the introduction into the meatus of a pencil, pin, hairpin, toothpick, etc., to relieve some temporary irritation, causes, as a rule, rupture of the posterior superior segment of the membrane. Suppurative otitis media is prone to follow such direct injury to the membrane from the fact that the foreign body is septic, and also on account of infection from the meatus. If the rupture be seen within a few hours of its receipt its edges will be found to be irregular and covered by a thin layer of extravasated blood, while blood will also be found in the meatus. If, however, the case be not seen until after the lapse of a few days it is practically impossible to distinguish such a traumatic perforation from the perforation produced by disease.

Spontaneous hæmorrhage into the tympanic cavity occurs occasionally in caisson workers, divers, and aeronauts, accompanied at times by rupture of the membrane and permanent injury to the delicate structures of the middle ear.

Indirect injury such as results from the pernicious habit of boxing the ear, violent sneezing, forcible blowing of the nose, forcible inflation, diving explosions, the use of the telephone, etc., most usually affects the inferior segment of the membrane. In many such cases weakening from previous disease is frequently present. In cases of indirect injury, healing, provided that the meatus is first disinfected and afterwards packed with sterile gauze, is, as a rule, rapid and complete.

A very interesting speculation and point for discussion arises as to how far injury—direct or indirect—or the traumatism produced as the result of protracted suppuration predisposes to the development of malignant disease of the tympanic mucous membrane or lining of the auditory meatus. At a former meeting of this Society I brought forward a case of rupture of the membrane from direct violence in which suppuration ensued, followed nine months later by the development of a middle-

ear epithelioma, which rapidly spread and killed the patient. I have also at the present moment a male patient under my care who has suffered for twenty years from suppurative otitis media. Three months ago he received a severe blow upon the ear. This was followed by an increase of suppuration, by pain, and recently by several attacks of spontaneous hæmorrhage. He is now suffering from malignant disease of the middle ear. What relation, if any, has the recent injury had to the development of malignancy? The medico-legal bearings of this question are obviously of great importance, upon which it would be desirable to hear the opinion of those present to-day.

Accidents during Operation.—Occasionally the jugular bulb, when it happens to present through a dehiscence in the floor of the tympanum, is wounded during the performance of a paracentesis. As a rule the hæmorrhage, which is profuse, is readily controlled by tight packing of the meatus.

In curetting the inner wall of the middle ear—always a matter of great delicacy—the stapes is at times dislocated and the vestibule opened up. To avoid such an accident, which may readily lead to purulent labyrinthitis, curetting should only be undertaken when the parts are fully exposed to view, and should be performed from behind forwards rather than from before backwards.

The varying relations of the knee of the lateral sinus of the middle fossa to the mastoid cortex are responsible, in part at any rate, for occasional injury to one or both structures. Two somewhat unusual accidents to the lateral sinus have occurred in the course of my practice. On one occasion when making the ordinary post-aural incision in a case which had previously been operated upon elsewhere the sinus was opened at the first incision down to the bone. The profuse hæmorrhage was at once stopped by plugging, and the parts carefully examined. It was then found that at the previous operation a small portion of the sinus wall had been exposed and had become adherent to the overlying skin during the process of healing. Upon another occasion, when making a conchal flap, the point of the knife punctured an exposed sinus wall, with resulting profuse hæmorrhage.

Injuries to the Pharyngeal End of the Middle-ear Cleft.—I have on two occasions known the Eustachian cushion to be literally amputated, but curiously enough upon neither occasion with any bad result.

Foreign bodies in the naso-pharynx at times cause injury to the mouth of the tube. Of this form of trauma I have, however, seen only one instance—viz. a case in which a marble from some unaccountable reason became wedged in the naso-pharynx and caused ulceration followed by sloughing and ultimate cicatrisation of the mouth of one tube.

INJURIES OF THE MIDDLE AND INTERNAL EAR.

By C. A. BALLANCE, M.V.O., M.S.

(Abstract.)

Injuries to the Tympanum and Internal Ear.—In fractures of the base of the skull, when there is extensive intra-cranial injury to the brain, the ear symptoms are overshadowed by the cerebral, though the aural symptoms may assist in the localisation of the graver injury. A fracture of the base in the middle fossa may run alongside the petrous, parallel with

its long axis, or across its base, implicating the tegmen atri and tympani, but not extending into the substance of the petrous; or it may pass through the petrous itself, splitting it longitudinally, or, more rarely, transversely, near its middle, or the tip may be broken off. According to some authorities there is a constant relation between the direction in which force is applied and the direction of the resulting fracture, so that the one can be inferred from the other. For example, a blow on the back of the head will cause a fracture at right angles to the long axis of the petrous, while a fracture resulting from a blow on the vertex or side of the head will be more or less parallel with the long axis of the petrous. It is impossible to determine the extent of the fracture during life, and it is not easy to do so even when the brain has been removed. Körber, indeed, goes so far as to say that the extent of a fracture in the petrous cannot be ascertained until the bone has been macerated.

In fracture of the base of the skull the labyrinth capsule itself may be broken through and the membranous labyrinth torn, but the bone forming the labyrinth capsule is too dense and strong for this to be the common result; the damage to the labyrinth is more usually caused by hæmorrhage into the tissue of the membranous labyrinth and into the labyrinth cavities. Should the injury not prove rapidly fatal from damage to the brain there is always a risk that in the further course of such fractures of the base suppuration of the labyrinth and meningitis may occur, and these grave consequences sometimes commence a considerable time after the injury. When recovery takes place the nerve-endings often suffer much damage from scar-tissue or even callus. Also the auditory nerve, and even the more resistant facial, may be compressed by extra-dural hæmorrhage. Intra-meningeal and intra-Fallopian hæmorrhage may also occur and temporarily or permanently arrest the functions of the nerves. In the labyrinth, as elsewhere, effused blood may, if not infected, be absorbed, and so restoration of function may occur, though, of course, some scar-tissue must inevitably replace the absorbed blood-clot.

The following case is one of those described by Barniek, who made careful *histological* examination. It illustrates the conditions found when the labyrinth is examined *soon after* an injury:

A man, aged twenty-nine, sustained a transverse fracture of the right petrous through a fall on the occiput. The symptoms were loss of consciousness, fever, vomiting, slow and irregular pulse. There was no blood in the meatus, but hæmato-tympanum on the right side. He died five days later. The dura mater, the sinus, the internal ear, and the tympanum proprium were not directly implicated in the injury. The bleeding into the tympanum had been caused by a fracture through the tegmen atri. In the auditory and in the facial nerve were many small hæmorrhages, and there were also hæmorrhages in the scala tympani of the basal coil of the cochlea, and the branches of the vestibular nerve, and in the neighbourhood of the maculæ acusticæ.

Graf had the hearing tested in a number of patients who had recovered from fracture of the skull, in which there was no reason to suppose that the pyramid had participated; the hearing was normal in only twelve out of thirty-nine cases. It has been suggested that the ear suffers damage analogous to the eye defects known as commotio retinæ. Passow also suggests that defective hearing may be caused, not by damage to the internal ear, but by damage to the central acoustic nerve-paths.

Symptoms: Hæmorrhage from the Ear.—When the tympanic mem-

brane, which in fractures of the petrous is usually ruptured, happens to remain intact, hæmato-tympanum will be present, but there may be no bleeding from the ear at all. Bleeding from the ear may be slight, or may be so free that life is immediately threatened thereby.

Escape of Cerebro-spinal Fluid.—Escape of cerebro-spinal fluid is a less common symptom than bleeding from the ear, and usually occurs after it. It is a sure indication that the subarachnoid space has been opened, and in the injuries we are considering the tear in the arachnoid is usually over the tegmen tympani or in the sheaths of the nerves in the internal auditory meatus.

Deafness is of the nerve type, is usually severe, and often absolute. It is sometimes permanent, and sometimes it is recovered from for the reasons already given. *Tinnitus* is often present, and is sometimes severe and persistent.

Vertigo.—This is only of value as a diagnostic symptom of injury to the labyrinth after the general symptoms of cerebral concussion have passed off, or if coupled with other evidence of destruction of the labyrinth. In most cases of injury to the head the signs of destruction of the labyrinth cannot, for obvious reasons, be sought for with the same care as in cases of ordinary ear disease, but it is well to bear them in mind. The symptoms of damage to the labyrinth are much more pronounced in injuries such as stab wounds, which do not cause cerebral concussion.

Labyrinth symptoms were very pronounced in the case of a nurse who came under my own observation, in which the damage was caused by the violent impact of the fine nozzle of a syringe. The patient did not completely recover for six months.

Facial palsy may occur immediately as the result of direct injury to the nerve, or secondarily, as the result of suppurative otitis: it is more often permanent than is the deafness. It is sometimes rendered permanent by slight displacement of a fracture passing through the Fallopian canal, and also by the pressure of inflammatory exudate in this small canal.

Loss of taste occurs in the anterior two thirds of the tongue on the side of the lesion when the chorda tympani is damaged. Sometimes the whole side of the tongue is affected, and then damage to the nerve of Wrisberg may be inferred.

Explosions and Loud Noises.—It is an old observation that the organ of hearing may be damaged from these causes.

Rupture of the tympanic membrane may, and no doubt does, sometimes occur in such circumstances, but less commonly than is popularly supposed. It is quite reasonable to infer that hæmorrhages in the labyrinth, similar to those that have already been described as occurring in fractures of the petrous, may occur from commotion of the skull and labyrinth, unaccompanied by fracture, as in blows of less severity, or the shocks caused by explosions and other loud noises. Schwartze says: "In the minor degrees of commotion of the nerves of the internal ear occurring once only the disturbance of function is temporary only. It is clear from the rapid disappearance of the symptoms that there has been no gross lesion of the labyrinth. We must infer that molecular disturbances of the labyrinthine structures have occurred, or that a passive hyperæmia of the labyrinth has been brought about by transitory paralysis of the vasomotor nerves, which are, it is well known, extremely susceptible, to traumatic disturbance." I am not speaking of the damage caused to hearing by repeated loud noises met with in boilermakers, gunners, and

others, but only of the damage sometimes caused by a single explosion or loud noise.

Simple rupture of the tympanic membrane is often followed by diminution of hearing, sometimes considerable, but, unless infected, does not usually give rise to other serious consequences. Concomitant concussion of the labyrinth is often responsible for the deafness. It is popularly regarded as a grave injury, and is not infrequently the subject of actions for damages.

Foreign Bodies.—If the tympanic membrane is undamaged inert foreign bodies may be tolerated in the meatus for a considerable time, but when the middle ear has been opened secondary infection and suppuration almost always result.

Death resulting from a foreign body in the ear is usually due to meningitis. A foreign body in an ear already the subject of suppurative otitis would be an urgent indication for the mastoid operation.

Gunshot Injuries.—The projectiles from rifles of modern construction have commonly such a high velocity that if the ear is struck the temporal bone is shattered and life destroyed; but shots from pistols, fowling pieces, and other weapons, or from rifles at a great distance, not infrequently lodge in the temporal bone, and the middle and internal ear are directly or indirectly injured. If the external meatus is wide and fairly straight a shot may traverse it and enter the tympanum without any external injury. Even when the petrous or base of the skull is not fractured consciousness is commonly lost, and on recovery headache, vertigo and tinnitus are complained of. The ossicles are usually shattered, and the temporal bone more or less extensively splintered. The projectile itself is often broken. Facial paralysis is by no means uncommon. Almost without exception the injury is followed by otitis media, which may, however, heal, even if the projectile is not extracted. It is not always easy to decide, without the help of radiography, whether a projectile has lodged in the ear, for the meatus is often so swollen and injured that no view of the deeper parts can be obtained. Many of the cases observed in civil practice are attempted suicides, and some remarkable recoveries are recorded.

Treatment.—The treatment of the minor injuries need not detain us—they should be protected from infection and not irritated. The external auditory canal and the adjoining portion of the pinna should be cleansed by wiping, and the application of 2 per cent. solution of iodine in rectified spirit, and a pad of sterilised or antiseptic wool applied and changed frequently. The ear should not be syringed, as by this means infective particles may be driven to parts previously sterile.

A fracture of the skull implicating a tympanum already the seat of suppuration is extremely dangerous, and if, when the patient is seen, there is already evidence of suppuration, operation obviously offers the only chance of safety. But whenever a fracture of the base of the skull extends into the middle ear, or the cavities in connection therewith, it is exposed to the air, and, like any other compound fracture, is liable to direct infection from without: moreover, the ear may first suppurate, and the infection subsequently pass through the fracture into the interior of the skull.

A compound fracture of the temporal bone is, as yet, not treated like a compound fracture of the femur by operation, except for some special reason, such as hæmorrhage or suppuration. Though the mastoid operation would expose the fracture and allow a Listerian dressing to be applied, which would prevent intra-cranial infection, yet this measure is

seldom carried out, and is not recommended as a routine treatment. At the German Otological Society's Congress in 1909 two cases of infection of a fracture of the petrous were discussed. In the one infection occurred early, and operation was successfully performed a few days after the accident; in the other infection occurred later, and no acute symptoms occurred until years after the accident. Operation was ultimately performed, but was not successful.

In gunshot injuries of the ear we have not only a compound fracture, but almost always lodgment of a foreign body, which is the more dangerous the more narrow and tortuous is the track, and no time should be lost in opening up the wound and removing the foreign body. Even if the shot cannot be removed forthwith, the danger is much diminished by a free external opening and by disinfection of the wound.

In operations for injuries of the ear, such as gunshot wounds, or suppuration from lodgment of foreign bodies, and in some fractures of the middle and posterior fossæ, the way of access should be by the mastoid. The operation should be the complete mastoid operation, and any extension thereof that the special circumstances of the case may require. No one unfamiliar with the mastoid operation is likely to be successful in cases of the kind.

Treatment of Facial Palsy.—In some rare cases the injury to the nerve may be exposed, and the nerve sutured *in loco*; in others an anastomosis, hypoglossal or accessory, may be done when all other effects of the injury have passed off.

Deafness, Tinnitus, and Vertigo.—Recent cases clearly show that persistent tinnitus and vertigo of peripheral origin may be relieved by surgical measures, but labyrinthine deafness due to injury is at present irremediable.

Dr. DAN MCKENZIE asked whether injuries produced by foreign bodies in the ear were peculiarly liable to lead to suppurative meningitis. He drew attention to a recent paper by Stenger, published in the *Archiv für Ohrenheilkunde*,¹ in which the whole subject of injuries to the ear, particularly those causing defective hearing, was gone into. Stenger dwelt on the occurrence and ætiology of labyrinthine concussion, a subject upon which he (the speaker) had hoped to hear something in the present discussion. Stenger produced upon animals labyrinthine concussion, and the lesions caused thereby are described in the article referred to.

Dr. FITZGERALD POWELL said that a very interesting case of gunshot wound had come under his notice, which probably had been seen by some other members of the Section. The man was shot by a Mauser bullet, which had entered the zygoma, had gone through the meatus, and had come out at the mastoid. The drum was intact, but hearing had been destroyed. As had already been said, the medico-legal point was a very important one for the otologist. In several instances parents had brought boys to him from school with a discharge from the ears, which was said to have been caused by the teachers having boxed the boys' ears. He, however, was sceptical about "boxing the ears" causing traumatic rupture of a healthy membrane. If there were previous blocking of the Eustachian tubes, such a result might happen. He would be glad to hear Dr. Milligan's opinion on that point.

Dr. H. J. DAVIS said he remembered an interesting case from the medico-legal aspect. The man was a tram-driver, and the overhead cable broke and fell on to him. He caught hold of it with his hand, and as a consequence he received a shock of a severe character. The patient was

¹ See JOURN. OF LARYNGOL., RHINOL., AND OTOL., February, 1911, p. 110.

unable to walk and became deaf in both ears completely, and in the action claiming compensation, in which he (Dr. Davis) was called to give evidence, the question arose as to whether the trouble was in the internal ear or in the middle ear. There was no reaction in the ear, and he thought the terrific electric discharge destroyed the auditory nerve. No lesion was visible in the middle ear. Vestibular reaction was absent, and it was a troublesome case to give evidence in.

MR. MACLEOD YEARSLEY said a discussion like this called to mind a large number of cases which one had seen, and there were one or two observations which he would like to make. With regard to othematoma, its pathology and its occurrence in the insane, a paper was published some years ago by Fleisch on the question of syphilis in connection with this condition. It mentioned that a large number of othematomata in the insane had yielded to treatment with iodide of potassium; and Fleisch suggested that as syphilis was so often a cause of insanity, it might also be the cause of the othematoma. He remembered seeing, some years ago, a burn of the membrane which occurred in a servant girl who had a wide, straight meatus. She was the victim of a practical joke by a fellow-servant, a footman, who had been lighting candles and thrust the glowing end of the taper into her ear. He saw the case the same day, and found a burn of the membrane, without any apparent injury to the meatus. Another interesting case, seen at the hospital, was that of a labourer who, having been told by a fellow-workman that a good treatment for toothache was to pour oil of vitriol into the ear, put a little strong sulphuric acid into it. Seen some days later he had a ring of granulations growing from the meatal wall. He did not think Dr. Milligan or Mr. Ballance had mentioned the possibility of injury to the tympanum by bodies carried in the mouth. Adams reported, in the *Proceedings of the American Otological Society* for July, 1895, the case of a child who was playing with the mast of a toy ship in his mouth. He fell, and the mast ran into the base of his skull, internal to the ramus of the jaw, passing through the floor of the tympanum, rupturing the membrane, and coming into the external meatus. It pierced the tympano-meatal floor and the membrane at the same time. He was interested to hear that Dr. Milligan once opened the lateral sinus at the first incision. Two years ago he (Mr. Yearsley) did the same thing, and in the same kind of case. He was re-opening an old mastoid in a child, and in incising the cicatrix the knife went into the lateral sinus, which was adherent to the scar. He had only once seen a foreign body in the naso-pharynx. This was the case of a gentleman who was sent up in consultation suffering from periodical attacks of pain in one ear. The pain was so great and so sudden in onset that when he was shooting he would, according to his doctor, drop his gun and howl with pain. On examining him with the finger in the post-nasal space, something was felt in Rosenmüller's fossa and found to be a gooseberry thorn. Nobody knew how it got there. The question of prognosis in old injuries of the ear was very important, and he would like to hear members of experience discuss it, as one was often asked whether in such cases hearing in the future would be restored.

DR. MILLIGAN, in reply, expressed his thanks to members for their appreciative remarks about the photographs he had shown. His experience of foreign bodies in the tympanum was very limited. In the cases he had seen the body had been pushed into the tympanum in the efforts to extract it from the meatus. That would therefore make him believe that foreign bodies in the tympanum were liable to produce meningitis, because considerable force had been used, and the foreign body was pro-

bably septic. As had been said, the medico-legal aspect of injury to the ear was very important. All present must have had cases in court in which they had had to give evidence as to whether a particular lesion was the result of disease, or whether it was traumatic. He thought that unless one saw the actual injury within a few days of its occurrence it was almost impossible to swear definitely that it was not due to disease. At the same time, what had helped him very much in the estimate of these cases had been to make a very detailed examination of the other ear. On various occasions he had derived in that way information which would establish the fact that the condition of the ear in question was due to previous disease and not to injury. It was difficult to lay down definite statements as to how one should distinguish one class of case from the other unless the patient were seen within a few days of the receipt of the injury. With regard to the question as to whether a normal and healthy drumhead could be broken by a box on the ear, experiments had been made, which showed that the healthy drumhead could withstand a pressure of five to six atmospheres. But he had seen cases in which a healthy drum had been broken by a blow on the ear. The majority of cases, however, had had previous trouble. One case was brought to him on the day the injury was received in a public school in England. The boy and the mother stated that there never had been any previous ear trouble. There was a very definite rent in the drum, and he did not think there had been previous disease. He thought a healthy drum could be ruptured by a blow on the side of the head. The question of suppuration was closely associated with that of treatment. Where there was no treatment beyond the insufflation of boracic acid, as in Dr. Hill's cases, he did not think that suppuration occurred. The cases did not usually come to the otologist first but to the general practitioner, who probably advised syringing, and that led to infection. With regard to Mr. Yearsley's point as to the pathology of othæmatoma and its relation to syphilis, he believed that in many of the cases there was a history of previous syphilis, which had probably caused a degenerative change in the brain and arterial system, and that there was pathologically a chondromalacia of the cartilage. That led to the question whether there was such a thing as "spontaneous othæmatoma" even in asylums. He had talked with many asylum people about it. They had all seen it, but doubted whether it was spontaneous. Probably in most cases it was the result of trauma. He would have liked to have heard more said in regard to prognosis after injuries, especially injuries of the internal ear, particularly after fracture of the base of the skull, so far as the auditory nerve was concerned. His own experience was that the outlook was very bad. Where the history was definite and there were symptoms of fracture of the skull with deafness, he had seen very few cases recover any great amount of hearing. He would also have been glad to have heard more about concussion. What was it? It was difficult to define. There were cases of concussion in which the internal ear was badly damaged. Was there not in most of those cases of concussion an actual hæmorrhage? In some of the cases of concussion in which the hearing was bad for a time there was a subsequent recovery of a good deal of hearing power. He thought that was because there had been a hæmorrhage which had been recovered from. He agreed with Dr. Hill as to the comparative infrequency of facial paralysis in fracture of the base. It was remarkable how many cases one saw in which the auditory nerve was severely damaged, but the facial nerve escaped injury. Another point which he was surprised had not been dealt with was one which had a very

important medico-legal aspect—namely, whether an injury to the ear in the case of an old suppurative condition had any relation to the development of malignancy. He did not see why it should not. For instance, malignant disease of the breast was said to often follow a blow, and injuries of long bones were frequently followed by malignant degeneration.

FIFTEEN SPECIMENS OF THE TEMPORAL BONE, SHOWING TYPES OF FRACTURES.

By ARTHUR H. CHEATLE, F.R.C.S.

Nos. 1 to 4 inclusive: Double line of fracture separating the roof of the Eustachian tube, middle ear, and meatus in one piece. Numbers 1 and 4 are of the diploëtic infantile type of bone. In No. 4 the membrana tympani and ossicles were intact.

Nos. 5 and 6: Very like the preceding specimens, but the posterior line of fracture involves the posterior meatal wall and exposes the antrum.

No. 7: The posterior line of fracture extends still further backwards to the posterior fossa, and involves the upper part of the sigmoid groove. The separated part is comminuted.

Nos. 8, 9 and 10: Line of fracture more transverse, passing through the roof of the middle-ear tract and mastoid cells to the posterior fossa externally to the facial nerve. In No. 9 the outer fragment is comminuted.

Nos. 11 and 12: Line of fracture passes through the bone just externally to the bony labyrinth and through the facial nerve as it leaves the shelter of the external semi-circular canal. In No. 12 the outer fragment is comminuted.

No. 13: Transverse fracture passing through the semi-circular canals and facial nerve, and a longitudinal fracture through the middle ear and meatus.

No. 14: Transverse fracture through the middle ear, carotid canal, vestibule and facial nerve.

No. 15: Transverse fracture through the Eustachian tube, front part of middle ear, cochlea, facial nerve, and internal auditory meatus. The intact modiolus is exposed on the outer aspect of the inner fragment.

SPECIMENS OF FRACTURED TEMPORAL BONE.

By G. J. JENKINS, F.R.C.S.

(1) Right temporal bone of female, aged one and a half. The fracture involves the roof of the middle-ear tract. Blood in the middle-ear tract, but not in the external auditory meatus.

(2) Right temporal bone of female, aged forty-one. Fracture involving the roof of the tympanic cavity and Eustachian tube, and inferiorly extending into the Glaserian fissure. The tympanic membrane is not ruptured. There is blood in the middle-ear tract, but not in the external auditory meatus. The section shows blood-staining of the air-cells of the mastoid element. Clots were removed from the air-cells and antrum.

(3) Right temporal bone of male, aged sixty-nine (previously described and exhibited). Fracture involving the middle-ear tract; blood in the middle-ear tract but not in the external auditory meatus.

(4) Fracture of the left temporal bone of female, aged one and a half.

The fracture involves the middle ear anteriorly at petro-squamosal antrum and Glaserian fissure. Externally it involves the postero-superior part of the external meatus, and extends to the parietal notch of the squamous element. There is blood in the middle ear and the external auditory meatus. The tympanic membrane is not ruptured, but there is a small perforation of the skin of the meatus postero-superiorly close to the tympanic membrane.

(5) Fracture of temporal bone in which the fracture involves the external auditory meatus. A large effusion of blood under the skin of the external auditory meatus fills up the lumen and prevents a view of the tympanic membrane.

Mr. G. J. JENKINS remarked that in the specimens (1), (2) and (4), in which the fracture did not involve the internal ear, he had made sections through the labyrinth, and found in specimen (1) there was blood in the neighbourhood of the foramen rotundum, and in specimens (1) and (4) there was blood at the fundus of the internal auditory meatus and in the auditory nerve. He suggested that these specimens support Stenger's experiments.

INTERNATIONAL CONGRESS OF MEDICINE AT BUDAPEST.

August 31, 1909.

SECTION OF LARYNGOLOGY AND RHINOLOGY.

(Continued from Vol. XXV, p. 607.)

THE TREATMENT OF NASAL HYPERTROPHIES BY ELECTROLYSIS.

BY DR. M. BRESGEN (Wiesbaden).

The author uses single needle-electrodes with platinum iridium points 3 to 4 cm. in length, as well as unipolar twin needle-electrodes, the points of which, 2 cm. in length, are separated from each other by a space of from 5 to 7 mm., and, in addition, unipolar twin needle-electrodes with points $1\frac{1}{2}$ cm. in length, 3 to 5 mm. from each other. These unipolar needles are attached to the cable either directly or through the medium of a contact-breaker. They have the advantage of permitting the passage of the current along a surface, the breadth of which exceeds the length, while at the same time single needles of greater length are applied to some other locality, as, for example, along the free border of the inferior turbinal. Thus the electrolysis can be brought into action by means of four needles simultaneously, two long, single terminals being introduced into the lower part of the inferior turbinal, and a unipolar twin needle into the upper part of the same structure. In this way the four needles represent three poles, one of which is attached directly to the cable, while the others lead to the contact-breaker. A satisfactory destruction of the hypertrophied nasal tissues follows the use of a current of 25 m.a. applied for ten minutes, and then reversed for the same length of time. In sensitive patients the strength should be reduced to 10 to 15 m.a., but in that case it must be continued for fifteen minutes. The

application does not produce any pain, and so it can be employed in children as well as in adults. Unlike the cautery its employment is not followed by reactionary swelling.

A CONTRIBUTION TO OUR KNOWLEDGE OF NASAL ASTHMA.

By DR. GROSSMANN (Vienna).

Experimental researches undertaken by the author with the object of explaining the phenomena occurring in nasal asthma gave the following results: Electrical and mechanical irritation of the nasal mucous membrane induced functional disturbance of the heart, and in consequence led to considerable vascular engorgement in the pulmonary circulation, manifesting itself in an increase in the volume of the lungs. This increased volume manifested itself in curarised animals in a rise in intra-thoracic pressure together with depression of the diaphragm. When the second branch of the trigeminal nerve or the trunks of both vagi were divided before the application of the irritant to the nose these phenomena were not observed. Thus he was here dealing with a reflex arc, the centripetal (*sic*) limb of which was formed by the vagus. The increase in the volume of the lung mentioned above was conditioned not only by the presence of a quantity of blood greater than the normal, but also by the circumstance that the internal spaces of the lungs were enlarged in proportion to the amount of vascular engorgement. That is to say, that the lungs were greater not only in respect to their external volume, but also in respect to their intra-pulmonary space. In correspondence with this fact the pressure sank in the intra-pulmonary space as a result of the vascular engorgement in the lesser circulation, while at the same time the intra-thoracic pressure rose. The increase in pulmonary volume went hand in hand with an immobility, whereby there was induced a considerable embarrassment of respiration. In animals whose breathing was spontaneous a further hindrance to respiration was noted in the fact that, as a result of the irritation of the nasal mucosa, inspiration was inhibited to the point almost of complete cessation.

Dr. NÉMAI (Budapest) held that the results of Dr. Grossmann's instructive experiments could not be used to explain the clinical events occurring in a case of nasal asthma, for these often showed an inexplicable defiance of rule. It was true that the disease was often improved by operations on the nose, but it should be remembered that not only asthma but even epilepsy was sometimes benefited by some surgical procedure undertaken for some other reason. In angina pectoris and in all other varieties of dyspnoea cocaine often gave great relief.

Dr. RÉTHI (Vienna) said that the good effects of cocaine in the nose might be explained either by assuming its action upon a reflex or upon congestive phenomena. It might be held that cocaine relieved the obstruction to the return flow. But such a conclusion would be fallacious, because the contractile action of cocaine upon the vascular channels actually rendered the return circulation from the cranium more difficult. The real reason was something quite different. If, for example, in the treatment of headaches a vaso-constrictor like adrenalin was given the headache often became more severe, while, on the other hand, eucaine, a vaso-dilator, relieved the headache. This proved that the beneficial action of the remedies depended upon their anæsthetic properties. This fact indicated the treatment to be adopted in asthma, which, being a neurosis,

could often be relieved by such simple measures as surface cauterisation, etc.

Dr. GOLDSCHMIDT (Munich) had treated some 3000 cases of asthma, and at least 2500 of these had been operated upon. In almost all the nasal operation had done good, but in none for any length of time. The asthmatic was in the highest degree suggestible, and anything new or impressive benefited him.

Dr. GROSSMANN, in reply, said that he agreed with Dr. Némai in hesitating to transfer the results of his experiments to clinical phenomena. He had not inferred any more from his experiments than what was actually obtained. But, at the same time, he held that the benefits derived from the use of cocaine and nasal operative procedures were no longer mysterious. It was a mistake to look upon all kinds of dyspnoea as due to asthma. The most frequent form of asthma was cardiac in type, and any measure which improved the condition of the heart would improve the asthma. But in all cases we should endeavour to avoid the logical fallacy, *post hoc, ergo propter hoc*.

THE EARLY STAGES OF OZÆNA.

BY DR. BAUMGARTEN (BUDAPEST).

Since children suffering from ozæna in its early stages seldom come for treatment he had examined them indiscriminately, and had continued examining the same children for years. He paid particular attention to those whose mothers had suffered from the disease, and in almost all of them ozæna was found. The clinical picture consisted in an alternation of contraction and distension of the turbinals every few days, together with the presence of gluey secretion and crusts. This alternation often lasted for two or three years, until finally the contraction became permanent, and the characteristic odour, crust formation and atrophy resulted. The earliest age at which this play of contraction and swelling was observed was that of four years. He described a peculiar condition suspicious of ozæna, which he had found in three new-born infants, whom he afterwards watched once or twice a year. There was nasal obstruction due to the presence of parchment-like tubular casts of the interior of the nose which continually kept re-forming. These three children some years later showed the early form of the disease mentioned above, and later on the typical appearances became manifest. The reason for the delay in the appearance of the disease until four or five years after birth could not be accounted for. At the same time congenital cases certainly did exist. Heredity was often observed, but never infection. In these early stages the results of treatment were excellent. He had got most benefit from phenol sulphoricinum.

Dr. THOST (Hamburg) recommended vaporisation with steam heated up to 120° C. The vapour induced a disappearance of crusts and fætor, in some cases permanently. It was quite harmless. The first reports on this method had been published by Dr. Boyé in the *Monatsschrift für Ohrenheilkunde*.

Dr. BROECKHAERT (Ghent) had employed paraffin for several years.

Dr. GRAZZI (Florence) was convinced that ozæna was an infectious disease, and that by the adoption of hygienic measures great benefit would accrue both to the patient and to the community.

Dr. RÉTHI (Budapest) drew attention to the use of electrolysis. In

all cases the factor was lessened. One or two sittings were sufficient. The mucosa became succulent and the secretion more liquid. It could not, of course, restore a cirrhotic and atrophic mucosa to the normal, but the influence on the factor was marked. With the negative platinum electrode in the septum and the positive copper electrode in the middle turbinal a current of 5 to 6 m.a. was passed for the space of five minutes. The effect in the untreated side and in the pharynx supported the theory of the influence of the nerves in the production of the disease.

Dr. MORELLI (Budapest) had found the sulphur spas of Budapest very serviceable in treating ozena.

D. M. (*transl.*).

(*To be continued.*)

AMERICAN LARYNGOLOGICAL ASSOCIATION.

Thirty-second Annual Congress, held at Washington, D.C., May 3, 4, and 5, 1910.

JAMES E. LOGAN, M.D., *of Kansas City, Mo., President.*

(*By courtesy of the New York Medical Record.*)

Second Day—Wednesday, May 4.

(*Continued from p. 154.*)

INTRA-NASAL ROUTE FOR GROWTHS OF THE HYPOPHYSIS WITHOUT EXTERNAL INCISION. WITH A REPORT OF A CASE OF INTRA-NASAL DECOMPRESSION.

BY DR. NORVAL H. PIERCE (Chicago).

The patient suffered from diplopia, increasing blindness and headache, and it was suspected that he might have a growth in the sphenoidal sinus. There was a muco-purulent discharge coming over the portion of the middle turbinate left from a previous operation; removal of this and of the anterior wall of the sphenoidal sinus was followed by exploration of the ethmoidal region, in which nothing was found. The removal of pressure thereby occasionally led to an improvement in the pain lasting only two weeks. A second operation was done later consisting of the following steps: (1) local anæsthesia with adrenalin; (2) removal of both middle turbinates; (3) removal of the septum between the following lines; (*a*) a vertical line drawn downward to the floor of the nose from the glabella; (*b*) a horizontal line drawn downward and backward from the lower anterior margins of the nasal bones to the body of the sphenoid bone; (*c*) a diagonal line which intercepted the lower extremity of the line (*a*) and ended at the point where the vomer joined the sphenoid. Flaps from the mucosa might be preserved to cover the cut edge of the septum. This was best removed by cutting forceps and chisel. (4) Removal of anterior walls of both sphenoid cavities and removal of the dividing septum. This was done either by means of the punches already employed for this work or by means of specially constructed chisels. (5)

Packing the nasal cavity with xeroform gauze. After healing was well under way we might proceed with the second step: (1) Anæsthesia, local or general, with adrenalin. (2) Removal of inner wall of sphenoid and exploratory puncture of walls of tumour. If it is cystic, then drain; if solid, remove with curette.

Dr. J. N. MACKENZIE said that Dr. West had already performed the intra-nasal operation several times on cadavers, and had published his views in the *Journal of the American Medical Association*.

Dr. R. C. MYLES had had three cases in which the tumour involved the sphenoid sinus, and in which it was necessary to remove the septum. Two were done by removing the nasal bone to one side, breaking loose from the frontal sinus and throat back to the sphenoid. The sinus was easily entered, and the growth removed. The hypophysis was easily seen, and could be entered.

DIAGNOSIS OF DENTIGEROUS CYSTS OF THE ANTRUM.

By DR. PIERCE.

For many years the division of these growths into follicular and periosteal had obtained. The former had its origin in errors or disturbances of development, through which degeneration of the dental sac eventuated, and was clinically characterised by the fact that the tooth to which the sac belonged was missing in dentition, unless it was a supernumerary tooth. This variety was extremely rare. The other variety originated from a peridontitis at the apex of the root of a fully developed tooth. Micro-organisms gained access to the peridont from the diseased pulp through the root canal. Epithelial remnants participated in the process, and the end result was a small cyst perched on the apex of the root, which was not infrequently removed *in situ* at the time of extraction. The sac consisted of connective tissue lined with epithelium. The cyst contents varied according to the presence or absence of infection. The cyst might increase in size until it perforated the antral wall.

CASE REPORTS ILLUSTRATING OCULAR AFFECTIONS DUE TO INTRA-NASAL AND ACCESSORY SINUS DISEASE.

By DR. LEWIS A. COFFIN (New York City).

A series of X-ray plates were shown together with a collection of charts illustrating the variations of the visual field for white and for colours. Cases were often not recognised in which aid was sought for relief to eye symptoms but in which the lesions involved the nasal mucosa and sinuses. He reported four such cases from his own experience and collated the literature on the subject. The various conditions of the eyes in such cases were summarised as follows: Circulatory disturbances, venous engorgement, choked disc, hyperæmia, edges of disc blurred, pallor of disc and frequent concentric contraction of the visual fields, especially the red. The reader of the paper exhibited charts of radiographic pictures of eight cases. He said that there were probably physiological variations in the normal fields of vision and that they varied under varying conditions, as fatigue, light, etc. The removal of enlarged turbinates pressing on the septum would, of course, cause eye symptoms, and relief of this pressure would cause them to disappear.

Dr. F. J. PARKER had examined the eyes of the cases mentioned by

Dr. Coffin. He said the eye men met a certain class of cases with optic atrophy, and that if no apparent cause could be found it was customary to give them iodide. He believed that many of these cases which had not improved and had been injured by the remedy were due to ethmoidal and sphenoidal disease. Some of Dr. Coffin's cases did not have sinusitis but turbinate swelling, and could be divided into two classes—those due to circulatory disturbances and those due to perineuritis, causing swelling and beginning atrophy. These cases showed first in the visual fields.

Dr. GREENFIELD SLUDER had seen a case of a boy who had had a headache and suddenly gone blind. The gap between the middle and superior turbinates was red and oedematous. With great difficulty he got this area to shrink with adrenalin, and the next morning, after a gush of a teaspoonful of pus and blood from the mouth, the boy could see.

TRANSPORTATION OF RIB CARTILAGE INTO THE NOSE IN A CASE OF NASAL DEFORMITY.

By DR. D. CROSBY GREENE, JUN. (Boston).

The patient was a young man referred to him on account of a deformity of the nose received in a football accident eight years ago. He had had an abscess of the septum following the injury. There was a symmetrical flattening of the organ at the bridge. Under ether the space for the implantation of the rib was prepared while at the same time the latter was carefully dissected away from its muscles, having been exposed by an oblique incision over the eighth and ninth ribs and removed without any injury to its perichondrium. In the meantime a vertical incision was made through the septal mucosa of the left naris just posterior to the mucocutaneous junction. Through this incision two layers of membranous septum were separated by knife dissection anteriorly as well as posteriorly. At its upper and posterior portions the chamber thus formed was enlarged backward and upward over the depressed nasal bones by means of a sharp rasp, which elevated the skin and soft tissue from the nasal bones. The size and shape of cartilage to be used was determined by fitting a piece of sterilised leather in the space prepared. A piece of cartilage was then fashioned according to this pattern and inserted, the wound being closed by a single catgut suture and the nares lightly packed with gauze. Healing was by first intention, and there was only moderate swelling following operation. The rib wound readily healed. In two weeks the man was all right.

SYPHILITIC STENOSIS OF THE ORO-PHARYNX.

By DR. INGERSOLL (Cleveland).

The patient was a young man who had acquired his syphilis some years before. There was difficulty in swallowing liquids, which regurgitated through the nose. There was a nasal opening through the scar-tissue about 1 cm. in diameter. Just below the tongue scar-tissue could be seen extending to the oro-pharynx, uniting the lateral and posterior walls of the oro-pharynx with the tongue. In about the centre of this tissue there was an opening $\frac{1}{2}$ cm. in diameter, through which food and inspired air could pass. The breathing was laboured, and the patient weak and emaciated. A free incision was made to the lateral pharyngeal wall on each side and then a good view of the larynx could be obtained.

All structures below the level of incision were apparently normal. In about a month of comfort the cicatrization began to reappear and the man was again incised and given a rubber bougie to pass several times daily. He then was lost sight of for five months, during which time he had failed to use the bougie, and fresh incisions were called for. He was then given metal tubes to use so that the tissue might not re-contract.

Dr. J. H. BRYAN commented on the obstinacy of these cases, and had found all plans unsatisfactory. He had tried the flap operation, bringing the upper and lower edges together and trying to form a posterior pharyngeal wall, yet there had been contraction, and his patient was very uncomfortable.

OBSERVATIONS ON THE VARIETY OF GERMS PRESENT IN WOUNDS FOLLOWING OPERATIONS ON THE FAUCIAL TONSILS.

By DR. ALEXANDER W. MACCOY (Philadelphia).

Some twenty cases were examined. Of these nine showed mostly staphylococci and streptococci. One showed the predominating organism to be a short, stout, spore-bearing bacillus. In another it was a short, stout, unidentified bacillus, singly and in pairs. In nine of the cultures there was no predominating organism, but colonies of cocci and common mouth bacilli. In four of them, however, a large diplococcus was found, and in two irregularly beaded bacilli. In one culture there were proteolytic colonies which digested the blood-serum; in none of the cultures were the Klebs-Loeffler bacilli found. The author concluded that there was no predominating organism in the pseudo-membranes; that mouth bacteria were to be found in all cases in varying quantities, the cocci being the most numerous, and that cultures would most often show staphylococci and streptococci, due probably in part to their greater hardiness on artificial media.

(To be continued.)

Abstracts.

PHARYNX AND NASO-PHARYNX.

Barnes, H. A.—*Hæmorrhage after Tonsillectomy*. "Boston Med. and Surg. Journ.," January 26, 1911, p. 119.

The author thinks the chances of post-operative hæmorrhage after tonsillectomy are no greater and probably not so great as in the old operation. The three spots most prone to bleed are the anterior and posterior pillars at their lower halves and the base between them. He describes the operation as performed by himself. In dealing with post-operative hæmorrhage three methods are available, short of tying the external carotid: (1) Simple pressure; (2) ligation of the bleeding point or points; (3) suturing of the faucial pillars. Any of these methods should be done under ether given in the sitting position.

Macleod Yearsley.

Parish, Benjamin D. *A Case of Subcutaneous Emphysema; an Unusual Complication Following the Removal of the Faucial Tonsils.* "Laryngoscope," November, 1910, p. 1046.

Swelling of the neck was noticed as the patient was recovering from the anæsthetic (ether). He quickly became cyanosed, and when the author saw him the entire neck was puffed out, the head extended, and both cheeks and the right eyelid were swollen. Crackling on pressure could be felt over these regions and "as far down as the last rib anteriorly." The jaws were prised open, the tongue pulled out, the head and neck bent forward, and restoratives administered. The emphysema could be felt over the chest for two weeks. Recovery.

The author supposes that the dissection, though it was not unusually deep, had penetrated the superior constrictor, and that air was forced through the wound into the neck by the struggling expiratory movements with a closed mouth. During the operation the posterior faucial pillar on the left was button-holed, but the author did not think that this was the point of entrance of the air.

Dan McKenzie.

Kœnig, C. J.—*Removal of the Faucial Tonsils, followed by Basedow's Disease.* "New York Med. Journ.," December 24, 1910, p. 1275.

The case was one of a young lady, aged twenty-eight, in whom a double tonsillotomy was performed for repeated sore throats. Typical Basedow's disease appeared four to five months later. The author discusses the possibilities as to the connection between the operation and the exophthalmic goitre, and suggests that it is quite possible that the repeated throat symptoms for which operation was performed may have been forerunners of the Basedow's symptoms.

Macleod Yearsley.

Bryant, W. Sohier.—*Epidemic Poliomyelitis.* "New York Med. Journ.," December 17, 1910.

Epidemic poliomyelitis, or infantile paralysis, originates through infection. The author has investigated clinically the disease and believes it is infectious and contagious, the contagion emanating from the naso-pharyngeal secretions. The disease is analogous to cerebro-spinal meningitis, an outbreak of which Bryant saw among soldiers at Savannah, in 1898, which always began with naso-pharyngitis, spread by association, and succumbed to mild nasal antiseptics.

Among diseases other than epidemic poliomyelitis and cerebro-spinal meningitis which enter by the naso-pharynx are lobar pneumonia, true influenza, and diphtheria. Both the latter may cause definite paralysis. The author thinks that in all these conditions the symptoms remote from the naso-pharyngitis are not really pathological entities, but complications.

Admitting all this, treatment should be directed to the naso-pharynx, and should consist of mild antiseptic applications (colloidal silver; argyrol, 25 per cent.; protargol, 30 per cent.; chinosol 1 in 2000). Chronic infections in the naso-pharynx (diseased adenoids, post-nasal catarrhs, etc.) are likely to be serious predisposing factors. The effects of this general and local treatment of infantile paralysis have been (1) restriction of pharyngeal infection; (2) rapid recession of the febrile conditions; (3) prevention of parietic symptoms. In times of epidemic poliomyelitis all cases of naso-pharyngitis should be regarded with suspicion and treated promptly.

Macleod Yearsley.

NOSE.

Gutberlet, W. (Munich).—*A New Nasal Irrigator*. "Münch. med. Woch.," January 31, 1911.

This is a glass apparatus resembling the German analogue of Woake's nasal douche, but of much greater size, holding 300 instead of about 50 gm. There is also an extra hole on the upper surface of the nasal tip, so that a portion of the stream is automatically directed towards the upper regions of the nose. *Dundas Grant.*

TRACHEA AND CESOPHAGUS.

Green, D. Crosby.—*Report of Three recent Cases of Bronchoscopy for Foreign Bodies*. "Boston Med. and Surg. Journ.," January 26, 1911, p. 117.

First case, boy, aged two and a quarter; foreign body a piece of fig, which became too macerated to be removed, and an abscess of the lung developed, from which the boy died. Second case, child, aged one and a half; foreign body a pin. Difficulty owing to point entering a fenestrum of the bronchoscope and becoming embedded in the bronchus; removed successfully by rotating tube. Third case, girl, aged eight, examined for probable foreign body. She had an atypical pneumonia. No body was found. The author points out (1) that in bronchoscopy for recovering a foreign body which plugs the bronchus, it is important to use a tube which is provided with many fenestra in its lower part; (2) that in bronchoscopy for recovering a long pointed object, such as a pin, the necessity for fenestra is less great, and their presence may cause a dangerous complication to the operation; (3) that bronchoscopy may be performed even in the presence of an acute inflammatory process in the lung without necessarily causing any ill-effects. *Macleod Yearsley.*

Clark, J. P., and Richardson, O.—*Case of Foreign Body in the Trachea; Status Lymphaticus; Death; Autopsy*. "Boston Med. and Surg. Journ.," January 26, 1911, p. 115.

A boy, aged sixteen months, who inhaled a peanut kernel. Radiographs showed neither foreign body nor enlarged thymus. Obstruction was little, if any, and there was no cyanosis. Ether was given and the body seen in the trachea, and as the child expired the forceps were closed upon the peanut, broken. Tracheotomy was performed, and respiration ceased during the operation. On its rapid completion the rest of the nut was expelled. Artificial respiration and strychnine were successful in starting breathing again, but he had a sudden violent convulsion, with twitching and opisthotonos, and died twenty minutes later, *rigor mortis* setting in immediately. *Post-mortem*, the thymus was found greatly enlarged, there was some enlargement of the bronchial, tracheal, and mesenteric glands, and of Peyer's patches, and there was a Meckel's diverticulum. Death was due to hyper-thymism.

Macleod Yearsley.

EAR.

Bardes, Albert.—*Ear Disease and its Prevention.* "New York Med Journ.," December 24, 1910, p. 1270.

The author appeals for a greater attention to be paid to the ear in regard to prevention, by insisting upon treatment in early stages of its diseases, and of those conditions of the upper air-passages which cause them.

MacLeod Yearsley.

Beck, J. C. (Chicago).—*The Comparative Merits of the Methods Employed in the Various Mastoid Operations.* "Laryngoscope," May, 1910, p. 515.

When using local anaesthesia the author has found that the electric drill is necessary for the bone work. "The hammer and gouge or chisel are unbearable to a patient under local anaesthesia."

He strongly recommends the use of the X rays in order to obtain an accurate knowledge of the anatomy of the mastoid to be operated on, and states that he has never been deceived by them. The paper is illustrated with radiograms of mastoids in health, in disease, and during the process of healing after operation. Radiography has taught him that the formation of granulations and the regeneration of bone proceeds more slowly after the electric drill has been used than after simple chiselling and curetting.

After operating for acute mastoiditis he fills the bone-cavity with blood-clot, or, better, with the following bismuth paste: Bismuth subnitrate 30 parts, vaseline 60 parts, white wax (melting-point 120°) 5 parts, paraffin 5 parts.

In the radical mastoid, after curetting the orifice of the Eustachian tube, he closes it with a small graft taken from the patient's arm and pushed into the tube on the end of a special probe in such a way as to fill the lumen and overlap the lips of the orifice of the tube.

As regards the meato-mastoid or "Heath" operation, his results, he says, are not encouraging. Two cases out of twenty-six did well, eight were still under treatment, seven had to be operated on a second time, and the remainder had disappeared.

Don McKenzie.

Wicart (Paris).—*Lumbar Drainage in a State of Infection or Hypertension.* "Arch. Internat. de Laryngol., d'Otol., et de Rhinol.," January-February, 1910.

The author states that since 1904 his experience leads him to believe that this procedure is of the greatest value, and although Friedrich, of Kiel, is of the same opinion, his method of operating differs in detail.

It is not sufficient to puncture only; free drainage is as necessary as in treating a case of septic peritonitis.

If there is not rapid improvement as evidenced by the general condition and repeated examination of the blood, a longitudinal incision a little to the side of the median line between the second and third lumbar vertebrae is made.

A sandbag placed beneath the patient serves to put the tissues on the stretch, and these should be divided, until an opening can be made into the spinal canal. A stiff drainage-tube is inserted, which should be stopped by a plug for the first two days, this being removed several times daily to allow of a slow and progressive discharge. Should no improvement result he advises trephining and making a subarachnoid incision followed by the injection of artificial serum.

Anthony McCall.

MISCELLANEOUS.

Ingals, E. Fletcher.—*Quinine and Urea Hydrochlorate as a Local Anæsthetic.* "Boston Med. and Surg. Journ.," December 8, 1910, p. 879.

The author gives literature and his own experiences. States that this anæsthetic is excellent in nasal surgery. The most satisfactory solution is one of 5 per cent. cocaine and 15 per cent. urea quinine in 1 : 2000 supra-renaline.

Macleod Yearsley.

Barton.—*The Elimination of Hexamethylenamine by the Mucous Membrane of the Middle Ear and Nasal Sinuses.* "Boston Med. and Surg. Journ.," June 30, 1910.

The author concludes: (1) Hexamethylenamine is eliminated by the mucous membranes of the middle ear and access of nasal sinuses. (2) Judging from the limited data at hand, it would appear that the drug is of considerable value in cases of acute suppurating otitis media and sinuses. The chronic forms are apparently benefited. (3) Upon *à priori* grounds, it may be fairly assumed that hexamethylenamine may prove to be a valuable prophylactic in those diseases commonly attended by otitis media; perhaps also as a prophylactic to be used prior to surgical operations upon the middle ear, the mastoid, and sinuses of the nose.

Macleod Yearsley.

Cobb, Carolus M.—*The Necessity of the General Practice of Medicine as a Preliminary Training for Those Engaged in Special Work.* "Boston Med. and Surg. Journ.," September 1, 1910.

A short practical article illustrated by three cases of ophthalmological and rhinological interest, which is worthy of note as insisting upon the importance of experience in general practice before embarking in special work.

Macleod Yearsley.

REVIEWS.

A Manual of Diseases of the Nose, Throat, and Ear. By E. B. GLEASON, M.D., LL.D. (Philadelphia). Illustrated. Second edition, thoroughly revised. Philadelphia and London, 1910: W. B. Saunders Co.

A considerable number of years have passed since we read with interest and gratitude a small work by this author entitled "The Essentials of Diseases of the Ear," and it is with pleasure that we see almost every line of that little work retained in the book now before us. There has obviously been a great deal added to it, and, of course, among the more important additions are those dealing with the operations on the middle ear, the intra-cranial complications of otic diseases, and the diseases of the labyrinth and the rest of the perceptive apparatus. The discussion of nystagmus, whether spontaneous or induced, is always complicated, and the author introduces several points which are not found in many other works, and which help to elucidate matters. To assist in this a useful diagram, attributed to Neumann, is introduced, which will be found worth careful consideration. Among the new illustrations there are many illustrating the topography of the middle and internal ear at different ages. Diseases of the nose have evidently

special interest for the writer, and the section on affections of the nasal septum has evidently been written with more than ordinary devotion. Although the author has identified himself with one special form of operation, he has not conceived any special bias in its favour, and he gives a most judicial account of the various operations for deflection of the part. He starts off with the main fundamental principle that the two factors interfering with the success of operation for the correction of deviation of the nasal septum are redundancy and resiliency, and he traces the development of operative proceedings, the oldest of which he attributes to Dr. Fletcher Ingals, whose method of operation is, in his opinion, the ancestor to the modern "window" resection. We are disappointed to find no reference to Hajek or Killian, although the final operation described is the one which has been ultimately elaborated by them, the description being, however, an extremely good one. The section on diseases of the larynx is singularly small in comparison with the others, and it is much to be hoped that in a subsequent edition it will receive the amplification which its importance deserves, and which the author's clinical opportunities make him so capable of carrying out. As far as it goes it is excellent, and contains many therapeutic and diagnostic hints of considerable value. We miss a reference to regurgitation into the larynx, which is so often the cause of intense suffering and rapidly fatal issue in laryngeal tuberculosis, and we should suggest that in regard to the symptoms of carcinoma of the larynx it should be more distinctly indicated that continued hoarseness, even without sharp pain, in a person over forty is sufficiently suspicious of carcinoma to render it advisable to keep the patient at least under observation. Laryngitis stridulosa as distinguished from laryngismus stridulus might be worthy of a more extended description.

The usefulness of the book is beyond question, and this is considerably increased by the valuable catalogue *raisonné* of formule to be used in the treatment of the diseases dealt with, the notes on the formule being even more valuable than the formule themselves. A revision of the Latinity might well accompany such little improvements as we have suggested when a new edition of this attractive manual is forthcoming.

Dundas Grant.

The Abuse of the Singing and Speaking Voice: Causes, Effects, and Treatment. By E. J. MOURE and A. BOUYER, Fils (Bordeaux). (Translated by MACLEOD YEARSLEY, F.R.C.S.) London: Kegan Paul, Trench, Trübner & Co., Ltd., 1910.

Though we are treated from time to time to controversial and not impersonal articles on the subject of "Voice Training and Mal-training," we have had of late years no systematic study of the voice as such from any of our British laryngological *confrères*, and by his translation of Moure and Bouyer's report on "Malmenage de la Voix Chantée et parlée," Mr. Macleod Yearsley has done good service to those laryngologists and voice-trainers who do not read French. In France the teaching of singing and the preparation of artists for the great opera houses is a national matter, and it was therefore with some responsibility that the authors, after presenting their report to the Société française d'oto-rhino-laryngologie in 1907, proposed the following resolutions:

(1) That no one should be admitted as a teacher of singing or even of elocution without having passed an examination in the knowledge recognised as indispensable to this class of master.

(2) The conservatories should always have one or several laryngologists, on whom should devolve the care of examining the pupils periodically, at the commencement, during the progress, and at the end of their studies.

This work shows on the part of the medical authors a considerable knowledge of the vocal art and of the artists, and any experienced laryngologist will recognise, in their description of the various disturbances arising from misuse of the voice, types which he has met with in his practice. Some difficulties will have been made less obscure by the study of this excellent little book. Moderation and eclecticism are the key-notes of the teaching contained in it. Breathiness on the one hand and excess of *coup de glotte* on the other are simply exaggerations of physiological co-ordinations. If the pupil's breathing is satisfactory in effect it should not be forced into any defined type. The costo-diaphragmatic type is in general advocated, but without too hide-bound exclusiveness. The maximum of respiratory capacity is not always the standard of respiratory perfection; control and regularity are of more importance. Too great respiratory power in proportion to the delicacy of the structure of the larynx is sometimes the cause of damage to the voice; in such cases the use of the much-decried corset may be beneficial. Such are some of the precepts which combine common-sense with science, and the work contains many more. For instance, tenors are strongly urged to use the mixed voice as much as possible, as many cases of damage to the voice are attributable to forcing the "chest" register upwards (*poitrine*).

Here and there a modification in the translation might be desirable. Thus, "passage" in the voice is understood by us as "break," though the French word might well be adopted so as to distinguish it from "break" as applied to the change in the voice at puberty. "Porte-voix" is difficult to translate, and "speaking-trumpet," though correct in one sense, seems scarcely appropriate to what may be inelegantly termed the "bellows-pipe." The word "study" on line 1 of p. 112 is obviously a *lapsus calami* for "teach." We have read Mr. Yearsley's translation with pleasure and profit, and are confident that many others will do the same. Another edition is sure to be called for.

Dundas Grant.

INTERNATIONAL CONGRESS OF LARYNGOLOGY, BERLIN.

The President of the Executive Council of the Congress desires to draw the attention of all members of the Section to the exhibition of instruments for œsophagoscopy and bronchoscopy that is being formed, and states that the Committee would be glad to receive at once descriptions of such instruments devised by English workers, together with clichés for illustrating them in the catalogue, and specimens of bodies removed, etc. They should be forwarded to Prof. Heymann, Lützowstr. 60, Berlin.

THE
JOURNAL OF LARYNGOLOGY,
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THE LATE PROFESSOR LUCAE.

On March 17 Professor Lucae passed away, not many months after his friend and fellow-worker, Professor Schwartze. He was the *doyen* of German otologists, and had taken a very active part in the foundation and organisation of various otological associations. His contributions to the literature of otology were most numerous, and in his work on "Chronic Progressive Deafness," published in 1907, of which we gave a somewhat exhaustive review in the JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY, much of his extended teaching and study was concisely reproduced. He was of a singularly amiable disposition, happy in his family relations and in his friends, endowed with a love of all that is beautiful in nature as well as in the musical and pictorial arts. He had the courage of his opinions, and his statement of them always commanded respectful and interested attention. Though delicate in health he had an apparently inexhaustible power of work, and went through several campaigns in his capacity as military surgeon. During his "wander years" he took part in Professor Politzer's first course of otology in Vienna, and studied in London under Toynbee. He spoke English, but his capacity for speaking it was eclipsed by his knowledge of our music and poetry, and particularly his fondness for the music and scenery of Scotland.

Professor Heme, in his sympathetic obituary notice of him in the latest issue of the *Archiv für Ohrenheilkunde*, concludes with

the following words: "His life was full of effort and work! Inexhaustible industry and rare energy distinguished it. A truly good man has been taken from us in the person of Lucae. His memory will, however, always survive in the history of otology as one of the first masters, and it will never fade in the hearts of his pupils and friends."

He was born on August 24, 1835.

D. G.

IMPROVED TECHNIQUE OF THE THIERSCH GRAFT FOLLOWING THE RADICAL MASTOID OPERATION: PRELIMINARY REPORT.

By CULLEN F. WELTY, M.D.,

San Francisco.

IN the technique of the Thiersch graft following the radical mastoid operation, it is absolutely essential that that operation be done in a very thorough manner. Every individual cell is destroyed until hard bone is encountered, or the dura, sinus, or nerve uncovered. This final destruction of cancellous bone is best accomplished with a hand burr. It can be done with a burr driven with electricity, but I prefer the electric burr for the bone of greater density. It is very essential that all the uneven surfaces be made perfectly smooth. The outer part of the bony meatus must be removed sufficiently to be on a horizontal plane with the floor of the tympanic cavity. The posterior bony wall must be cut down to the floor of the newly made bony meatus. By this procedure more room is gained, and the pocket formed by the tympanic cavity is eliminated.

In the removal of the posterior bony meatus and facial spur, great care must be exercised not to injure the facial nerve. This is best overcome by chiselling the wall away with large chisels, and working parallel to the nerve, so that in the event of the nerve being uncovered it would not be cut. This particular method will enable the operator to remove more bone than any other, and with more safety to the facial. The mucous membrane of the tympanic cavity must be entirely removed. I mean that after a very thorough inspection none can be detected. In doing so it will be necessary in most cases to use a haemostatic agent of some kind, such as hot saline solution, peroxide of hydrogen, or adrenalin. Most careful attention must be directed to the Eustachian tube in

order to remove the mucous membrane thoroughly. The tympanic wall should be so thoroughly removed by chisel and made smooth by bürs that the small searchers of Jansen's will not be arrested.

Everything that has been said so far is important in every radical ear operation. However, it is much more important when the Thiersch grafts are to be applied, as any infection that may remain in the bone will ultimately destroy the graft, and you will fail to accomplish what you set out to do. The Neumaun plastic should be adopted in preference to all others for this particular procedure, the upper and lower flap being sutured in place, and the point of the **V** sutured to the auricle. The sutures to be used in holding the **V** part of the plastic should be catgut. The sutures for the upper and lower flap had better be catgut; if not they must be removed when the skin-graft is applied. The other sutures, if allowed to remain, may or may not cause trouble in the after-treatment of the case.

Four days following the radical ear operation the Thiersch grafts are applied. This particular time has been selected because the granulations are comparatively small, although in some cases they are quite large. After trying the grafts both earlier and later, I have selected the fourth day succeeding operation as the best for all cases. In the near future I am going to use this same procedure in detail at my first operation.

On the fourth day, patient having been anaesthetised, the operation field is cleaned in the usual way. The whole cavity will be covered with granulations, all of which must be most carefully removed; special attention must be directed to the tube. At this time I use hot saline solution as a haemostatic agent, inspecting the cavity from time to time, and finally, to reassure myself, using peroxide of hydrogen several times. When I am satisfied that everything is away, I put in gauze saturated with adrenalin; this gauze is held in the cavity under pressure by an assistant while the grafts are being prepared. At the time I begin my preparation of the ear, the nurses are preparing the leg or part from which the grafts are to be taken. In this preparation bichloride has never been used. Steril salt solution is used in excess, all the other aseptic procedures being followed.

I try to get about three or four grafts $\frac{1}{2}$ in. wide by 1 in. long. Some smaller ones $\frac{1}{4}$ in. by $\frac{1}{2}$ in. Some of the grafts may be lost in preparation or in applying them. The Jansen spatula is used. Grafts are taken from the razor direct to the spatula, and after all edges are straightened they are put aside for use. When the

grafts are in readiness the adrenalin tampon is removed from the ear. The cavity will be found to be absolutely dry, and if not more adrenalin must be used, as the cavity must be free from oozing blood or the graft will not adhere. The first one is fastened with a searcher into the tube, bringing it out over the floor of the tympanic cavity posteriorly; second, superior to the first, brought back over facial into mastoid cavity. The third usually covers the remaining wall of the attic and antrum. The three that have been used are the larger ones. The uncovered areas that are now left are covered by the remaining grafts, the one being selected that will cover the denuded area best. Small pledgets of cotton are now used to fix the grafts; they must be so small that they do not touch either surface while being put in place. The first one is put over the tube, the second firmly applied to the posterior superior quadrant, the next over the stapes, and so on until all the grafts are held well in place, so that they will not be materially disturbed when a dry tampon is introduced. The size of this tampon corresponds to a piece of gauze 4 in. to 6 in. square. After the dry gauze a similar piece of gauze is saturated with the oil of vaseline (Chesborough), and packed within the mastoid cavity. After this a similar piece, in size larger or smaller, as the occasion may demand, is inserted to fill the entire cavity made by the operation.

The posterior wound is now closed in the usual manner. It will be found that an additional tampon by way of the meatus will assist materially in holding the plastic in the desired position, resulting in a very large meatus, with cut surfaces all within the ear. This materially adds to the comfort of the patient, as well as preventing contracted meatus. The usual outside dressing is applied. The ear tampons are removed on the fourth day.

If there is any difficulty or pain in the removal of the tampons peroxide of hydrogen can be used in excess to soften and loosen tampons, to get rid of blood, and to stop bleeding, so that the small cotton fasteners that were put in to hold the grafts in place can be seen and taken away.

In 50 per cent. of the cases you will look into a white cavity; in fact all of them will be seen to be white if trouble is taken to stop the bleeding that comes from the inner surface of the soft parts that have been sutured and could not be covered with graft.

This is the improved technique of the Thiersch graft in the radical ear operation.

As a matter of fact a graft never adheres sufficiently to the tampons to be torn from its attachment. I have purposely tried to pull one away for experimental purposes, but it was so firmly attached that the ordinary Politzer ear forceps would slip off. I was compelled to use an anatomical forceps and to hold with considerable strength to pull away.

In some of the cases the outer layer of epidermis loosens; this occurs in ten days or two weeks after the graft had been applied, and a delicate epidermis is left that hardens in a very short time. I hardly know how to account for the fact that in some cases the entire graft remains in place while in others the outer layer comes away. The only explanation that I can offer is that in some instances the graft is too thick. However, this does not seem to be serious, as the cases heal in about the same time. Occasionally it will happen that granulation-tissue makes its appearance when the edges of the graft are not in perfect apposition, but it is very easily destroyed with the ring knife. At the next dressing the denuded area will be found to be completely dermatised.

Occasionally, excessive granulation-tissue makes its appearance posteriorly in the region of the plastic. It can be removed with the curette, and the cavity packed tight with gauze saturated with sterile oil of vaseline. Contrary to the teaching of to-day bichloride of mercury 1:3000 is used to irrigate the cavity. This is necessary when there is an unusual amount of pus, or odour from secretion. In other instances when there is more *débris* than should be, I always irrigate with the intra-tympanic cannula and under inspection, so that the force of the stream is directed to the particular spot that requires attention. I also irrigate with normal salt solution, sterile water, and boracic acid solution.

As has before been said, the oiled dressing is removed in four days, or sooner if necessary. In two days a second dressing is made, which usually includes an irrigation of bichloride of mercury of 1:3000, and from this time on the wound is dressed daily until complete recovery.

The particular reason for the bichloride irrigation at the second dressing is to remove the disagreeable odour caused by the oil of vaseline becoming rancid. This happened in all my cases, but I did not care to make a change until this report had been made. In a case operated a few days ago I used $\frac{1}{2}$ per cent. solution of carbolic acid in paraffin oil U.S.P., and to my surprise there was no odour; besides, the mastoid cavity was in

better condition than in any of my previously operated cases. In fact the case is so near well in two weeks that it is difficult to find uncovered areas. I believe this antiseptic added to the oil will further materially improve the technique. This case is not included in those reported.

The final procedure of every dressing is a final drying of the ear. After this pulverised boracic acid is blown into the ear and single small pieces of gauze $\frac{1}{2}$ in. square with a small roll of gauze to fit snugly into the outer meatus are inserted. As a rule the bandage is left off from ten to twelve days after the original operation.

In several of the cases vertigo was complained of for some time. In three instances it continued after the ear was entirely dry. The only explanation that I can offer is that of a circumscribed labyrinthitis that has not entirely recovered—there remains a hyperemia of the bony canal—or possibly it occurs because the canal is simply covered by epidermis and is more or less influenced by the atmospheric temperature. To counteract this latter I packed the meatus, but it did not seem to have any influence. Another reason that occurred to me was that of pressure on the stapes by the graft.

The only cases that were excluded from this series of twenty-one cases were one of labyrinth suppuration and two in which the dura was so diseased that it would not have been safe to use a skin-graft.

CASE 107.—Hearing not improved. Can offer no explanation. In my history-card she is marked "lengthened Schwabach."

CASE 119.—Hearing made worse. This case had an acute serous labyrinthitis which subsided; two weeks after had a similar attack.

CASE 121.—Hearing made worse. Can offer no other explanation than an impaired cochlea, which was shown by the Schwabach test; this patient had a circumscribed labyrinthitis as well. This is also one of the patients who has more or less vertigo and tinnitus; this is disappearing and, I believe, in a comparatively short time will be gone.

CASE 123.—Perfect result, but have no way of measuring the hearing.

I wish to say that never before in the history of otology have eighteen cases been brought to healing in so short a time.

That never before in a series of 18 cases were 4 cured in 3 weeks. That never before in a series of 18 cases were 10 cured

in 4 weeks. That never before in a series of 18 cases were 4 cured in 6 weeks. (This latter statement may not be correct.) That never before in a series of 18 cases was the hearing improved in 14 of them. That never before in a series of 18 cases were 11 of them made to hear a whisper 15 feet or more. That never before in a series of 18 cases were 7 made to hear a whisper at 25 feet or more.

In conclusion, I will now make the statement for the first time, unreservedly: Every case of chronic suppuration is dangerous to the individual and should be operated, and that all cases will recover if properly operated.

Second, that the hearing will be improved in the large majority of cases.

Third, that there is no danger associated with the operation provided that the labyrinth is intact. The latter statement is based approximately upon two hundred mastoid operations.

Table of Cases.

Case.	Age.	Sex.		Duration of discharge.	Operative findings.	Hearing.		Duration of after-treatment.
		Male.	Female.			Before operation.	After operation.	
104	26		+	Childhood	Cholesteatoma	Whisper 6 in.	Whisper 6 ft.	6 weeks
105	14	+		2 years	"	Speech 6 ft.	Speech 15 ft.	4 "
107	28	+		Childhood	"	Whisper 3 ft.	Whisper 3 ft.	6 "
108	19		+	"	"	" 12 ft.	" 26 ft.	1 "
109	10	+		"	"	" 1 ft.	" 25 ft.	4 "
110	14	+		"	"	" 1 ft.	" 25 ft.	4 "
111	25	+		2 years	"	" 3 in.	" 6 ft.	6 "
113	33		+	Childhood	"	" 3 ft.	" 20 ft.	3 "
115	26	+		1 year	"	" 15 ft.	" 26 ft.	4 "
117	16	+		Childhood	Caries	" 1 ft.	" 6 ft.	4 "
118	12	+		5 years	"	Speech 3 ft.	" 25 ft.	3 "
119	16	+		2 "	"	Whisper 25 ft.	" 3 ft.	4 "
120	9	+		7 "	Cholesteatoma	" 1 ft.	" 6 ft.	3 "
121	29		+	Childhood	Caries	" 6 in.	Speech 6 ft.	3 "
122	29		+	"	"	" 3 ft.	" 3 ft.	4 "
123	4		+	3½ years	Cholesteatoma	—	Good	4 "
124	30	+		Childhood	"	Whisper 2 ft.	Whisper 15 ft.	5 "
125	18		+	10 years	"	Speech 2 ft.	" 25 ft.	4 "

18 cases in all; 11 male, 7 female; 13 cholesteatoma and 5 caries.

The duration of after-treatment dates from the day of the radical mastoid operation and not from the date of graft, which was four days later.

A NOTE ON TURBINAL AND SINUS FUNCTION.

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To the views here stated I have given expression as occasion offered during the last few years; they are based on many observations and experiments, which, though not so complete as could be wished, yet seem sufficiently corroborative to justify publication. The paper deals only with what may, for short, be called the hygrothermic function of the nose, the warming and moistening of the inspired air.

The contention is that the accessory sinuses have a more, the turbinals a less, important share in this function than is usually assigned them. It is not contended that the sinuses have no value as enriching the resonance of the voice or lightening the structure while conserving the strength of the skull; but these seem subsidiary to their respiratory value. In detail the thesis is as follows:

(1) The whole mucous membrane of the respiratory tract from nostrils to bronchioles is hygrothermic and the chief agent to this end.

(2) The whole nasal mucous membrane is specially concerned in this function.

(3) The sinuses are accessory not only anatomically but also physiologically, more especially during the forced respiration of exertion.

(4) The turbinals, while important accessories to the hygrothermic function, especially during quiet respiration, are probably quite as much directional and regulatory in their action, *i. e.* they help to regulate the amount and direction of the air current going to and drawn from the sinuses and respond to the amount required for the lungs.

The current view is that the turbinals are the chief agent in warming and moistening the inspired air; that the sinuses are in man, a microsmatic mammal, the anatomical remnant no longer physiologically useful, of a more complex system found in macrosmatic mammals. In the latter the olfactory nerve has a much wider distribution over the sinuses which thus subserve the sense of smell. This statement seems to me correct in what it affirms, but wrong if it denies their hygrothermic usefulness to respiration, or if it affirms that all the sinuses in macrosmatic mammals subserve

olfaction. This, however, after a full consideration of the literature and of the whole question of the function of the sinuses, is the view to which, for instance, Zarniko comes; but still, he admits that it is rather striking that the main inspiratory current goes past the fore end and not over the body of the inferior turbinal, the chief erectile body in the nose.

We have to consider—

(1) The behaviour of the turbinals during quiet and during forced respiration.

(2) The air-path during the same.

(3) The position and structure of the sinuses, and also the position of their orifices relatively to (1) and (2).

(1) *Behaviour of the Turbinals.*—After quiet respiration in a warm room has lasted some time they are found to be full. Some of my medical friends frequently complain of the nose being blocked on entering a warm room after having breathed freely out of doors. On current theory and if the hygrothermic action of the turbinals is directly as their fulness, this is the reverse of what should be. If, now, a nasal speculum be allowed to remain in the nostril for a minute or two they will be seen to shrink. Why? And above all, why, if the air at room temperature, entering freely the dilated nostril, is to be warmed to body temperature? As the nostrils dilate on exertion it struck me this might be a reflex due to the dilatation. A lad was sent on a smart walk; his turbinals, previously full, shrank decidedly. Those of a man after a run shrank even more; those of a sprinter, after a very fast sprint, were drawn tight to the bone as if adrenalised. Special attention was paid to the middle turbinal of the sprinter; its anterior end was quite contracted, and the entrance to the semilunar hiatus, previously a tiny slit, was now frankly opened. Mouth-breathing has nothing to do with this action, as the exercises were done with mouth shut. These observations have been repeated on different subjects at different temperatures and the effects observed both in and out of doors, always with the same result—that is, the turbinals, if hygrothermic, are least in evidence when most wanted. If, however, the sinuses are important aids in warming the air, we can understand the turbinals shrinking to allow of free passage of air to them, and therefore from them. Similarly, the reflex collapse of turbinals on dilatation of nostrils might be purely or partly a temperature response as distinguished from an exertion one, to allow of intermingling of warmed sinus air with the colder external current. Various experiments were

tried with less decisive, but on the whole similar, results, namely, some shrinking on exposure to reduced temperature. And again, as regards moisture, a hot dry atmosphere was found to shrink the turbinals more than a hot moist one, the reverse of what we should expect if the turbinals are the moistening agents. About these effects of moisture and temperature, as they are difficult to determine and as there are often complicating circumstances, I wish to be less emphatic; what is certain is that the effect of exertion always dominates that of heat or temperature alone.

(2) *The Air-path*.—Observations have been made by allowing the patient to inhale aristol, which is a very light powder, and then noting its route, with or without the subsequent application of cocaine and adrenalin. During quiet inspiration the path is that mentioned by Paulsen, mainly past the fore end of the lower turbinal and passing between the middle turbinal and the septum to the nasal roof and down in front of the sphenoid. When the current reaches the anterior end of the middle turbinal and the sphenoid face eddies must be formed, as Franke has proved and as the layer of aristol on the middle turbinal shows; but I find that when the current reaches this point it forks, a smaller portion going by the semilunar hiatus.¹ As to the amount of air going by these two routes much depends on the shape of the septum and of the middle turbinal. A septum with a low bulge outwards below a middle turbinal bulging inwards makes the semilunar the main path; but usually, the main path is the olfactory one between middle turbinal and septum. And we should expect this; for during quiet respiration we are always smelling though we are not always noticing. During exertion matters are different; smell is subsidiary; and in the heavily breathing sprinter the aristol was found thickly plastered round the inlet to the semilunar hiatus; in other words, right round the inlet to the sinuses as well as on adjacent parts of turbinal and septum; in fact, during such respiration I have also seen the lower meatus lined with powder, showing that the whole nasal surface is brought into action during forced respiration.

The main air-path, especially during quiet respiration, is the septal or olfactory one; the external or semilunar path comes more into play during the forced respiration of exertion. Indeed, both paths are then much more open. It has been stated (Kayser) that absence of the inferior turbinal makes no difference to the air-path,

¹ I ought to point out that an eddy will form more readily before the bluff end of the middle turbinal of quiet inspiration than when the turbinal is shrunk to a sharp edge by exertion.

but this is only partially true. In quiet respiration most of the powder is deposited at the same sites as in a normal nose, but it is also found lower than usual. If, however, a patient without lower turbinal sniffs aristol, even slightly, a thick coat of it will be found along the septum parallel with the turbinal site, and some of it on the nasal floor; normally it would all go higher up. This was demonstrated in a case where one lower turbinal had been removed by another surgeon; the different deposition of powder in the two nostrils showed that the main air-path, was altered as indicated. It is probably this alteration of the air-path not the mere absence of turbinal, that sets up pharyngitis; except in quiet respiration the air is no longer directed properly through the upper reaches of the nose and past the sinuses.

The expiratory air-path is stated to be the same as the inspiratory (Paulsen). This seems only partially true. The vertical choanae, in contrast to the horizontal nostrils, help to direct the main inspiratory blast parallel with, instead of athwart the turbinals, so that the chief current is above and below the inferior turbinal. This can be seen with some difficulty by examining the nose of a smoker who is exhaling very gently through his nose; and it is a well-known fact that it is easier to blow out of the nose mucus or pus or a pledget of wool when that is in the inferior meatus than when it is higher up. But neither during inspiration nor expiration is the air in any part of the nasal cavity devoid of movement (Paulsen).

(3) *The Sinuses and their Orifices.*—They are in two groups, the ethmoid being shared between them. The posterior ethmoidal cells and the sphenoidal sinus open on the olfactory or septal air-path; the anterior ethmoid cells, frontal sinus and antrum open on the external or semilunar route. The orifices of all open directly on the inspiratory air-paths and are therefore readily ventilated during breathing, and that is why the sphenoidal and antral ostia are in the upper parts of those cavities, well placed, not for drainage, but to allow of warm air readily rising out of them. The ventilation of these cavities will be after the fashion of a Sprengel pump; the main current streaming past will take on some of the sinus air with it, which will be instantly replaced by succeeding air from the nasal cavity. The direction of the main expiratory current being in the lower reaches of the nose where none of the sinus ostia open, sinus ventilation will be more thorough during inspiration than during expiration, so that the sinus air will mostly have the interval between the end of one inspiration

and the beginning of the next to get warmed. Franke noted that an eddy of smoke-laden air entered the sphenoidal sinus during inspiration but was not disturbed during expiration; none, however, entered the frontal or maxillary. After donching an antrum in the usual way by puncture through the lower nasal wall I joined a T-tube by rubber connections to the cannula, a gas tap and a Bunsen burner, and lit the last white. It is very difficult to get a flame still enough for accurate observation; but so far as I could judge the flame was unaffected by quiet respiration; this we should expect if the inspiratory path in quiet respiration is mainly septal. During forced respiration the flame seemed to move up and down; when the patient blew through both nostrils the movement was very decided; when he closed the sound nostril and blew through the other the flame gave a sudden jump, then went out (it was away from direct blast, a yard behind his head). The current is probably not usually so strong as this, for the extinction of the flame happened only once; where there was blocking of middle meatus the flame was unaffected. But there seems sufficient proof that during strong respiration such as occurs on exertion the sinuses are all frankly drawn upon, as they certainly are during sniffing and snorting. With regard to Franke's observation that only the sphenoidal sinus was seen to be entered by a whorl of smoke-laden air, I have to suggest that for reasons above stated this is the only sinus we should expect to be so entered during quiet inspiration, because then the main air-path is on the septal side of the middle turbinal; the shrinking of the turbinals on exertion allows the larger external sinuses to be drawn upon. The capacity of the sinuses has been estimated as twice that of the nasal cavities proper—probably a low estimate, so that they are capable of storing a fair volume of warm air. They are well placed in the skull for warmth, having a lining membrane capable of giving off a certain amount of moisture, and, as Tunis has pointed out in a paper published while this is being written, their orifices are surrounded by mucous glands which must contribute to this effect. The ventilation of the sinuses will take place the more easily because of the expansion of the air warmed in them rising to meet the cooler nasal air.

When we consider, therefore, the capacity of the sinuses, their character, their position, their relation to the air-paths, and also the shrinking of the turbinals on exertion, it is difficult to avoid the conclusion that the sinuses are chambers for storing reserves of warm, moist air to be instantly mingled with the inspiratory

air, especially on exertion. In other words, they are accessory to the hygrothermic function of the nose as a whole. And when one further considers the accessory cavities of a horse, an animal whose nose is designed to deal with the respiration of exertion, the idea that these cavities merely subserve olfaction, or that in man they are mere structural padding or evolutionary remnants, is unthinkable. Such merely structural cavities are seen round the frontal boss of the ox in connection with the frontal sinus; but they are obviously for strengthening the frontal plate, and different from the adjoining respiratory sinuses. The ethmoid might be regarded from its spongy structure as mere scaffolding, like the bulk of the mastoid cells, but it is a curious fact that it is shared between the two air-paths and the two groups of sinuses, and bears some resemblance to the extraordinary spongy structures which nearly fill the bulk of the nose of the seal, and which are turbinals. This is one of the few mammals that Turner classifies with man and apes as microsmatic; it has no accessory sinuses. To the question of the comparative anatomy and physiology of the sinuses I hope to return in a future paper, but would remark here that the ethmoid probably helps to moisten the air.

The view thus advanced is somewhat similar to that of Luschka and H. Meyer, but brings the sinuses in more direct relationship with the respiration of exertion. Against those authorities most critics urge that the orifices are too small to allow of the sinuses being of more than very subsidiary use; but that interchange of air between these and the nasal cavities proper is pretty constant any one will believe who, travelling alone in a railway "smoker," watches the course of the smoke if he shuts all the openings except one window partially. This view also differs from that of Braune and Clasen, who would limit the usefulness of the sinuses to the times when there is a very decided negative pressure, as during sniffing, the nostril being more or less closed.

If the present contention be correct certain interesting inferences follow. The ablation of the sinuses cannot be regarded as a triumph of surgery. We should expect a pharyngitis then to arise; and, for the same reason, after ablation of the inferior turbinal. Also, the effect of exercise on the turbinals points to one important element in the treatment of what is called vaso-motor rhinitis, apart altogether from the beneficial effect which exercise has on the elimination of the toxins apt to be present in the blood in this condition. Finally, of the mastoid cells the antrum alone is constant; its function is unknown; may it not be an accessory cavity

to the tympanum, so that colder air coming up the Eustachian tube would be immediately mixed with warmer air from the antrum? The tympanic orifice of the tube points toward the aditus, and, although the ossicles come between, the incoming air will go toward the wall on which opens the aditus. Every time we perform Valsalva's experiment the tympanic membrane goes outward and warm air must necessarily be sucked out of the antrum.

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OTOSCLEROSIS.¹

By DR. GUSTAVE BRÜHL (Berlin).

(Abridged translation by DAN MCKENZIE.)

OF recent years it has been generally agreed that the deafness characteristic of otosclerosis is the result of an osseous ankylosis of the stapes in the oval window, the middle ear in other respects being free from abnormality. With regard to the ætiology of the disease, however, there is still much difference of opinion. Questions have been asked as to the original seat in the bone of the lesion which induces the ankylosis. Is it to be found in the periosteum or in the capsule of the labyrinth? And if in the latter, in which layer of the bone, the internal or the external, does it occur?

All the agencies with which we are acquainted as causing bone disease in general have, at one time or another, been looked upon as being of importance in the production of otosclerosis. But none of these assumptions have satisfied the requirements.

Quite recently, indeed, doubts have actually been thrown upon the significance of the ankylosis of the stapes itself, and the classical view which looks upon the fixation of that ossicle as the *causa causans* of the symptoms of otosclerosis has been submitted to searching criticism. The grounds for this criticism lie in the fact

¹ From *Les Archives Internationales de Laryngologie, etc.*, January-February, 1911, p. 1. We desire to express our indebtedness to the editor of that journal for kindly permitting us to use the blocks of the diagrams illustrating the article.

that osseous changes similar to those which exist in and around the ankylosed stapes have been found elsewhere in the petrous bone. And, indeed, such widespread lesions may occur without the stapes being itself affected. The disease in which, up to the present, these changes have been found to be most prevalent, is congenital or hereditary atrophy of the nerve elements in the labyrinth. Moreover, in cases where the stapes has undergone ankylosis without any sign of bone disease elsewhere, atrophic changes in the labyrinth are by no means uncommon. The old idea was that these atrophic changes were secondary to the ankylosis, and that they were of the same nature as the labyrinth degenerations which so frequently follow other diseases of the middle ear. But it has lately been suggested¹ that the atrophy of the labyrinth is the prime factor in the situation, and that the ankylosis of the stapes is only a secondary or accidental phenomenon. That is to say, that otosclerosis is nothing but one of the varieties of a disease of the internal ear—of degenerative hereditary deafness, to wit. Thus, in spite of all the clinical and microscopic research of the last twenty years, the picture of otosclerosis is still blurred and indistinct.

My own personal views on the essential nature of the disease are the outcome of a series of anatomical investigations upon the auditory organs of eight individuals, whose hearing had been carefully examined during their life-time. The specimens include examples of simple ankylosis of the stapes as well as examples of atrophy of the labyrinth without ankylosis.

Before going on to describe what I found in these specimens I shall give a brief sketch of the normal condition of the region of the stapes.

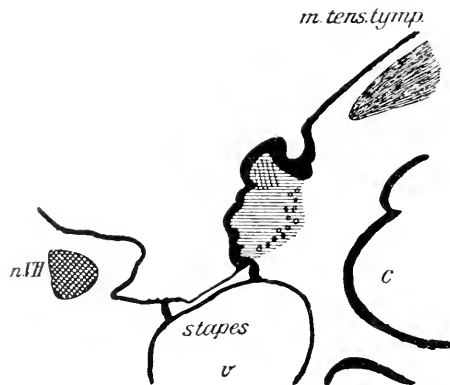
The osseous capsule of the labyrinth is composed of two layers of bone; first, an external layer, covered with connective tissue, and contiguous to the mucous membrane of the middle ear; and secondly, an internal layer derived originally from cartilage, and extending into the periosteum lining the interior of the labyrinth. In this internal layer there are numerous islets of unossified cartilage even in the adult bone. The foot-plate of the stapes in the oval window is invested with a delicate covering of mucous membrane, the deeper layers of which merge into and become identified with the periosteum of the ossicle.

In otosclerosis certain areas of the bone undergo a process of porosis or spongification, the tissue of which is characterised, *inter*

¹ Manasse, *Verhandlung, der Deutsch. Otolog. Gesellsch.*, 1909.

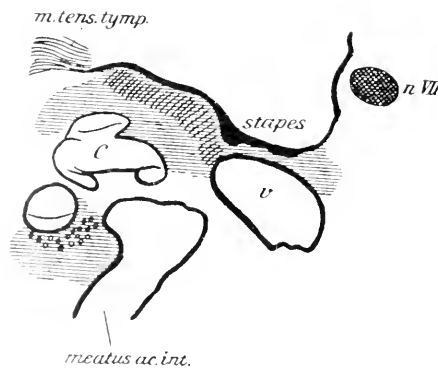
alia, by a strong affinity for microscopic stains. These disease-areas or foci are separated by a clear line of demarcation from the hard, eburnated, and compact bone around them. The new bone is very vascular. It is rich in cell-constituents, and the cells are

FIG. 1.



large and irregularly distributed. In addition to these features, the bone of the disease-areas presents a considerable difference in the size and contents of its medullary spaces, and there is also an obvious difference in its age. The clinical effect of the lesions,

FIG. 2.



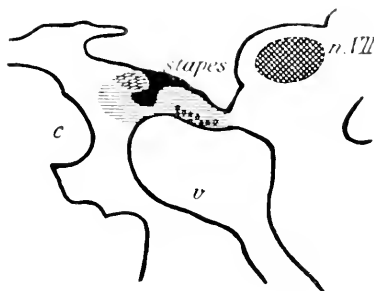
like those of certain pathological changes in the central nervous system, depends upon their situation and upon their extent.

My preparations fall into four groups, according to the situation of the hyperostoses: (1) Those in which the changes in the bone lie in the vicinity of the stapes, *without* ankylosis of the foot-plate (Fig. 1); (2) those in which the focus is limited to the region of the oval window and stapes, *with* ankylosis of the foot-plate

(Fig. 2) ; (3) those in which multiple and extensive hyperostoses are present *with* ankylosis (Fig. 3) ; and (4) those in which the hyperostoses are situated some distance from the stapes and in which ankylosis has *not* occurred (Fig. 4).

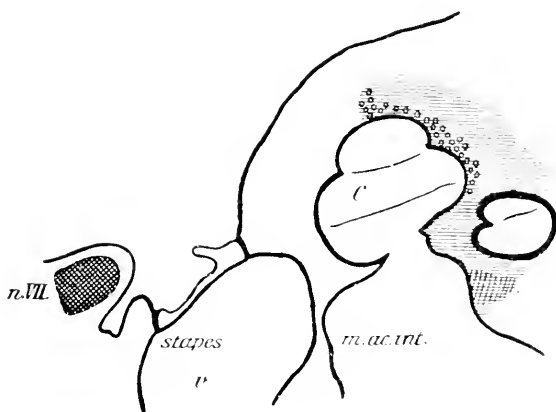
The first point that calls for remark in examining my specimens

FIG. 3.



is the observation, not, of course, a new discovery, that the bone in front of the fenestra ovalis is always more seriously affected than that lying posterior to it. The second is that the site of origin of the change in the bone appears to have been at the spot where the bone is oldest—that is to say, superficially, just under the peri-

FIG. 4.



osteum. Further, in almost all the specimens, in addition to those foci of proliferation which are situated at the region of the older bone, we find others extending far beyond the region of the stapes and promontory. In all the specimens, also, obvious new formation of bone by osteoblasts and resorption by osteoclasts is visible. This observation applies particularly to the younger areas of

diseased bone. The disease-areas present, as it were, the appearance of an enucleable foreign body.¹ In only two of the specimens (Fig. 4) are the changes confined to that part of the bony capsule which is developed from endochondrium.

We find, then, first, deafness affecting patients in whose petrous bones osseous new formations, occurring in close proximity to the oval window, have led to ankylosis of the stapes; and secondly, deafness occurring in patients in whom the same kind of bony transformation is situated at some distance from the oval window, without having induced any ankylosis.

Do these facts disturb the conventional ideas of otosclerosis? In my opinion they do not.

With regard to the influence of atrophy of the labyrinth, we cannot ascribe to it any particular ætiological importance in the production of ankylosis of the stapes. To begin with, such atrophic or degenerative processes in the labyrinth are constantly present in suppuration and other diseases of the middle ear. But no one would dream of attributing to these nerve-lesions any rôle in the causation of the suppuration. Moreover, in young patients the stapedia lesion is so definite and striking that the nerve degeneration can have but a secondary and subsidiary place in the evolution of the malady. It is, indeed, impossible to imagine by what means atrophic changes in the labyrinth could provoke such a definite and unmistakable lesion as that of ankylosis of the stapes.

The cases, on the other hand, in which foci of bony transformation are distributed throughout the petrous bone without affecting the neighbourhood of the stapes, and in which atrophic changes in the labyrinth are also present, seem to me to be different, ætiologically speaking, from those in which ankylosis of the stapes exists. In the former we have probably to do with trophic disturbances, for such disturbances are more likely to affect bone formed from endochondrium, seeing that that kind of bone is poorly nourished, and exhibits a marked proclivity to undergo resorption. Still, even when we grant this possibility, it is difficult to establish any link between the disseminated lesions in the bone and an atrophy of the labyrinth. We may, to be sure, refer both these conditions to one and the same disturbance of nutrition. But it must be remembered that the bone disease may exist without any sign of disease in the labyrinth. At all events, if deafness is present it is due to the atrophy of the nerve elements in the labyrinth, and so does not, of course, present the same characters as the typical middle-ear deaf-

¹ Alexander, *Arch. f. Ohrenheilk.*, lxxviii.

ness of otosclerosis. If the atrophy of the labyrinth were the initial lesion in otosclerosis, then the sufferers from that disease would come to us with the signs, not of middle-ear deafness, but of nerve deafness.

In the pathological picture of otosclerosis there is only one constant concomitant to the stapedial ankylosis, and that is a fibrous thickening of the mucous membrane of the middle ear close to the disease focus in the bone, and without doubt secondary to it.

The porotic change in the osseous tissue cannot be regarded as inflammatory. Dr. Orth, after an examination of my specimens, came to the same conclusions with regard to the osseous lesions as Starem did after examining Siebenmann's preparations,¹ namely, that the change in the bone consists in a spongy hyperostosis produced probably as follows: The vessels in the periosteum enlarge, and at the same time the bone, which is developed from periosteum, undergoes resorption, its place being taken by new-formed porous bone.

To call a process such as this "periostitis" or "osteitis" would not bring us any nearer to a solution of the problem. Besides, periostitis and osteitis in the bone of the ear are conditions so well defined that it would be better to avoid using these terms in discussing a lesion so different from them as that which induces ankylosis of the stapes.

Bony ankylosis of the stapes as a result of inflammations or adhesions in the middle ear may doubtless occur, but it must be very rare. And when it does occur it can only be looked upon as a purely accidental consequence of the inflammatory disease.

For these reasons, the best name for the lesion present in otosclerosis is *spongy hyperostosis in the oval window*. Siebenmann's term, *spongy transformation of the petrous bone*, may be used to designate that group in which foci of new-formed bone develop some distance from the oval window, and do not necessarily lead to ankylosis.

We now come to consider why it is that the bone in the neighbourhood of the stapes is so liable to this transformation. Are there any conditions in this region which favour such a change?

In order to elucidate these problems I submitted my preparations to Prof. Gebhardt, of Halle, the well-known authority upon transformations of bone. His opinion coincided with mine. And my opinion is, that the changes in the bone which lead to the typical

¹ *Zeitschr. f. Ohrenheilk*, xxxiii.

ankylosis of the stapes are the result of the action of forces of traction and compression. The neighbourhood of the articulation of the stapes is a likely spot for the development of proliferation in the bone for the following reasons: Immediately in front of the oval window the tendon of the tensor tympani passes over the "arciform fasciculus" on its way to the malleus; secondly, the movement of the stapes is more extensive in the anterior than in the posterior pole of the oval window. The continual pulling of the tendon together with the friction of the foot-plate of the stapes on the anterior border of the foramen ovale produces an incessant movement of the periosteum and an irritation of the bone lying between the tendon and the annular ligament of the stapes. The cartilaginous covering of, and the cartilaginous residua in, the bone at this place render it very liable to transformation. To sum up, the traction and friction induce hyperæmia and a tendency to proliferative processes in the periosteum and in the bone.

As a rule, the formation of hyperostosis remains limited to the oval window, but in some varieties (Fig. 3) isolated areas of transformed bone may also be found elsewhere in the capsule of the labyrinth. In such cases the focus in the vicinity of the stapes is the oldest. We may therefore assume that the production of the diffused foci is set agoing by the initial deposit at the oval window.

The fact that in typical cases the ankylosis of the stapes is, however, limited to the neighbourhood of the oval window favours my theory of the ætiology. For as soon as the articulation becomes ankylosed the irritating movements come to an end, with the result that there is no further proliferation. Another point in its support is that otosclerosis is rarely found in diseases of the tympanic cavity, in which the stapes or the tensor tympani have been immobilised by adhesions, etc.

That only comparatively few individuals suffer from otosclerosis may be accounted for by supposing a peculiar predisposition like that which leads to the formation of multiple osteomata elsewhere in the body—a predisposition which seems to be hereditary.¹ To this we may add the activity of growth about puberty, and the influence of syphilis, trauma, etc.

This theory of mine has some bearing upon treatment. When an

¹ Recent surgical opinion as to the causation of multiple osteomata refers these outgrowths to the influence of rickets, which, by disturbing and distorting the regular lines of ossification, leads to the displacement and isolation of islets of ossifying cartilage. From these displaced islets the osteomata arise.—*Trans.*

articulation is threatened with ankylosis as a result of constant irritation the obvious remedy is rest to the irritated parts. To this point Pause has already drawn attention. If, then, we were able to diagnose the presence of a hyperostosis at the oval window before the onset of deafness—say, by observing obvious discoloration of the membrane or hyperostoses elsewhere—we might arrest the disease by dividing the tendon of the tensor tympani, or by removing that part of the malleus to which it is attached.

In cases of ankylosis with an intact labyrinth, it might be advantageous to perform a mastoid operation, and to open a new fenestra at the tuberosity of the ampulla (of the external semi-circular canal?), as hyperostosis rarely occurs at this place.

But before these suggestions can be confidently adopted, it will be necessary to carry out many more *post-mortem* investigations upon people whose hearing has been carefully tested during life.

ENDOTHELIOMA OF THE FRONTAL BONE.

BY NEIL MACLAY, M.B., C.M.,

Surgeon, Throat and Ear Hospital, Newcastle-on-Tyne.

W. F.—, aged sixty-seven, the subject of illustration, consulted a doctor on February 15, 1911, on account of a painful swelling over his right orbit. The practitioner describes the condition as a red, fluctuating, circumscribed lump, the size of a walnut, situated over the inner limit of the right eyebrow. The presence of pus was diagnosed and an incision made; only blood escaped, and a friable new growth projected from the wound.

Four days afterwards I saw the patient and found a fungating mass, in situation already named, which entirely obscured any evidence of incision and extended fully $\frac{1}{4}$ in. from skin surface; the centre of growth corresponded with position of anterior wall of right frontal sinus.

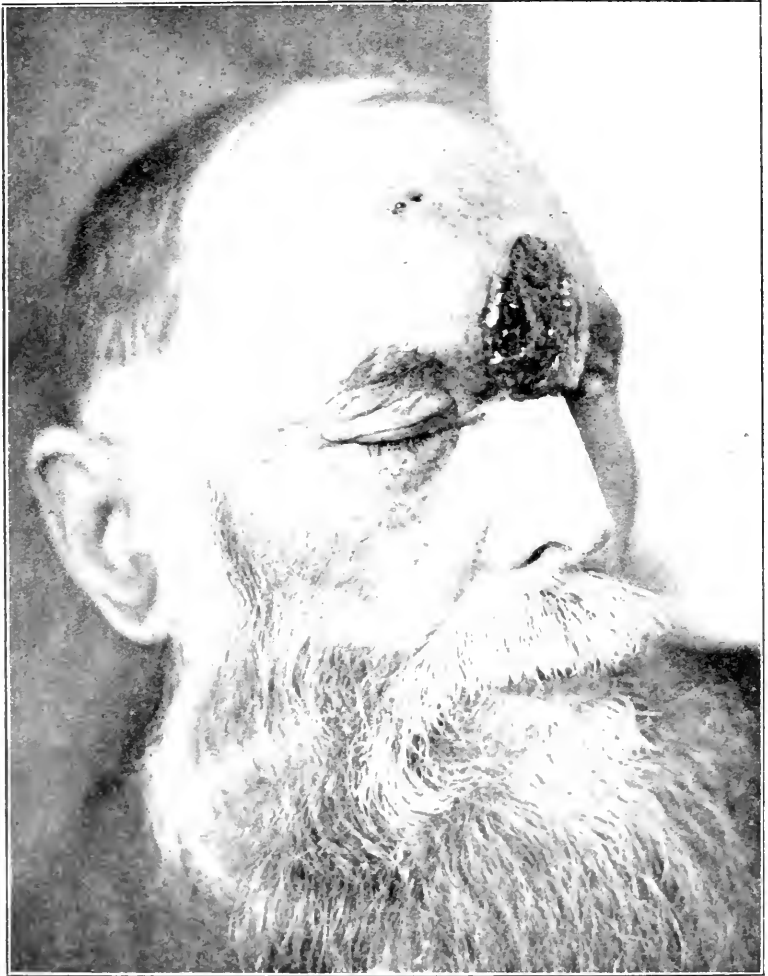
A probe could be passed easily into sinus and down through fronto-nasal duct. Great destruction of bone had taken place; not only two thirds of anterior sinus wall but a good part of posterior wall had disappeared, and the growth extended $1\frac{1}{2}$ in. towards frontal lobe.

The pathological report submitted by Prof. Stuart McDonald described the structure as an endothelioma with much evidence of necrosis.

Surgical interference was not advised, and in spite of rapid growth little or no pain existed till a fortnight before death, which

took place in April, 1911, and was preceded by left-sided clonic convulsions.

The history of the case shows that no subjective symptoms



existed till a week before advice was sought, and then only pain was complained of and some slight bleeding from right nostril.

A small ill-defined swelling over right eyebrow was first noticed by patient's friends about the close of the year 1910, and was thought to be due to a knock. Subsequently, as size of lump increased, it was regarded as a "blind boil," and received some domestic attention.

There were no eye signs or symptoms at any time.

I am disposed to regard frontal sinus as the seat of origin of growth.

SOCIETIES' PROCEEDINGS.

PROCEEDINGS OF THE ROYAL SOCIETY OF MEDICINE—LARYNGOLOGICAL SECTION.

April 7, 1911.

DR. P. WATSON WILLIAMS, *President, in the Chair.*

SPECIMEN OF A PEDUNCULATED GROWTH ON AN ELONGATED UVULA.

By MR. HERBERT TILLEY.

The specimen was removed from a male, aged thirty, who said that the growth on his uvula had been present as long as he could remember, but had given rise to no irritation or coughing until the last three months. The uvula measured nearly 1 in. in length, and from its lower end hung a pedunculated growth. The stalk measured $\frac{1}{4}$ in., and the small tumour is about the size of a dried pea. In order not to spoil the specimen no section of the growth has been made, but it is probably a small fibroma.

Dr. PATERSON said he had seen a similar case, where the uvula was longer than in this case, as it had to be hooked up with a probe to see the tip, which had a papilloma on it. He did not know whether the patient in Mr. Tilley's case complained of symptoms actually caused by the little growth at end of a long uvula. In his (the speaker's) case it was observed accidentally, and it produced no symptoms whatever, proving that a long uvula need not produce discomfort, and should not be sacrificed merely on account of its length.

The PRESIDENT (Dr. WATSON WILLIAMS) said that whereas an elongated uvula was at one time removed fairly frequently, it was now relatively rarely done. But it was possible to jump to an opposite conclusion, and say an elongated uvula never caused symptoms. But that was not true, for his own had caused trouble at one time years ago, but after it was shortened the trouble it gave rise to disappeared.

AN IMPROVED FORM OF HAY'S PHARYNGOSCOPE.

By MR. HERBERT TILLEY.

This improved pharyngoscope gives a larger image, and the lamps are prevented from touching the pharyngeal wall and so causing discomfort. If cocaine is previously applied to the posterior pharyngeal wall the instrument causes no retching, and it is useful for demonstrating lesions to novices who cannot use the posterior rhinoscopy or laryngeal mirrors.

Mr. TILLEY, in answer to the President, said he had found it useful

in post-nasal cases. In the course of hospital work he preferred the ordinary mirrors for making rapid observations.

CASE OF CHRONIC LARYNGITIS.

By MR. WALTER HOWARTH.

Patient, aged thirty-three, came to the hospital two years ago complaining of profuse nasal discharge with foetid crusts. There was active necrosis of the nasal septum, which gradually cleared up under iodide of potassium. A year later the patient became husky, and the cords were seen to be red and thickened and did not approximate properly. The interarytænoid space was clear. The voice gradually improved, but some heaping up in the interarytænoid space became noticeable. This has steadily progressed, and now has a mamillated appearance. The condition of the vocal cords and of the voice is much improved. The cleft in the left posterior faucial pillar was present when the patient was first seen. Treatment with alkaline lotion of potassium iodide has been practically continuous for the last two years.

Dr. DUNDAS GRANT said it was a form of laryngitis which resulted from nasal suppuration, and such cases were not always easy to deal with. They might be spoken of as post-rhinitic. Although in this case there had probably been syphilitic disease of the vomer, the condition of the larynx resulted rather from the accompanying suppuration than from any specific element in the case. It was what might be called a kind of pachydermia of the interarytænoid mucous membrane, and it would be well to remove it. Such swellings did not always interfere with the voice, because sometimes they were at a higher level than the vocal cords.

Mr. HOWARTH, in reply, said that he regarded the condition as a result of chronic irritation due to the prolonged nasal suppuration. It was remarkable that the condition of the vocal cords seemed to have improved considerably, and yet the interarytænoid fold had got worse. At present the voice was not bad. He did not propose to do anything operative unless further signs developed.

TRACHEO-LARYNGOSTOMY FOR STENOSIS FOLLOWING TRACHEO-LARYNGOTOMY.

By DR. WILLIAM HILL.

Girl, aged eight years. A so-called high tracheotomy was performed five years ago for diphtheria, and the child has been obliged to wear either an intubation tube or a tracheostomy tube ever since, except for an occasional few days when an attempt has been made to get on without an artificial apparatus. Two years ago the stenosed larynx was dilated with bougies after internal laryngotomy and a larger intubation tube worn for three months, but in renewing it the stenosis quickly recurred and it had to be re-inserted. Tracheo-laryngostomy was performed by the exhibitor six weeks ago. The use of rubber wings for keeping the drainage-tube in position and the fissure open is the invention of Mr. Charles Hope.

Mr. HERBERT TILLEY said that two years ago he had treated a child of about the same age which had had a high laryngotomy or thyrotomy done, in fact the tracheotomy tube had been put through the side of the

thyroid cartilage and left there. The usual results followed, viz., granulations arose around it, and ultimate cicatrization occurred in the cricoid region, so that at the operation it was only possible to pass a probe upwards through the larynx from the low tracheotomy wound. He tried the method of tracheostomy and laryngostomy, and opened up the larynx and trachea. The lumen of the cricoid region was obliterated, and its place taken by thick scar-tissue. It was difficult to cut out the scar-tissue, but some of it was removed, and he then placed a rubber tube through the larynx and upper part of trachea. The patient was in the hospital for months, and plastic operations were tried to cover the laryngo-tracheal wound. But the cricoid region became narrower and narrower, and then became as stenosed as before. Therefore a rubber tube was kept in, removing and replacing it every fourth day. After eight months the patient was sent out with a dilatation through the original cricoid stricture. The trachea was closed in front, and the child could breathe through the larynx and through the original constricted region. But there was anxiety because stridor occurred on great exertion, and there was likelihood of trouble if the child got any laryngeal catarrh. Afterwards it was stated the child was doing fairly well. There was a great deal of trouble connected with the case, and such cases were desperate to start with. The value of intubation depended to some extent on what was the condition in the upper tracheal or cricoid region. If there were any granulations there intubation was excellent treatment, because the intubation tube would press away the granulations, and leave a fairly patent airway. But if the obstruction was fibrous he thought there was not much benefit from intubation. He had a case at present in which ten days ago an intubation tube was put in, following high tracheotomy for diphtheria, and the child was doing well; the tube had been left out for two days, and breathing was good without it. (Since the last paragraph was written the child has died of broncho-pneumonia, and the autopsy showed a fair airway through the cricoid region.)

MR. DE SANTI said the majority of the cases of the kind he had had were in adults, and in those cases, he agreed with Mr. Tilley, intubation was of no use. He remembered one man particularly, who had extreme stenosis, and only a small tube could be got in, but it was dilated up to the largest sized Schrötter tube, and there was good breathing for the time. But the patient went back again rapidly and re-contraction took place. He had to wear a tracheotomy tube for the rest of his life. One day he got mixed up in a drunken brawl, his tube came out, and he was brought into Westminster Hospital dead. He had operated on the thyroid by splitting it. He found that even when keeping the alae aside, though re-adhesion might be prevented, recontraction nearly always took place. He feared that in the present patient there would be recontraction, especially as there was a tendency for keloid to form.

DR. FITZGERALD POWELL said that two or three cases in his practice occurred to him—in which contraction had taken place after the removal of a large portion of the larynx—and in which he had got very good results by the use of silver and ebony plugs, slipped in above the tracheotomy tube, passing through the cavity of the larynx upwards into the pharynx. One was a case of fibro-sarcoma of larynx, and the other syphilitic stenosis of larynx. In both these cases about half the larynx had been removed. The plugs were kept in for six to twelve months, being taken out occasionally for a few hours, cleaned, and re-inserted. When it was decided to remove them the edges of the tracheotomy wound were freshened and brought together, and breathing took place through

the larynx. In neither case was there any recontraction, there was good breathing space, and in the specific case a good strong voice resulted; in the sarcoma case the voice was not so good and more whispering. The great point about the treatment was that the plugs must be kept in for at least six months.

Dr. DUNDAS GRANT said his experience of tracheo-laryngostomy had not been very encouraging, but in one instance it was to be explained by a point which was worth remembering. A very bright little boy had a tracheotomy done on account of laryngeal diphtheria. It was done too high, and was followed by extreme narrowing. It was not merely stenosis, but absolute atresia. Dr. Grant performed tracheo-laryngostomy, and the boy went on very well for some time. Unfortunately, at that time, there was a reconstruction of the wards, and it was impossible to get a reasonable temperature in them. The boy developed bronchitis and died. In a work on the subject great stress was laid on the necessity of keeping the ward at a high temperature. Recently he had another case, a child, with absolute atresia. He removed the high tracheotomy tube and introduced it low down. The child had to go home to the country, but when it returned and was ripe for operation there was, unfortunately, an outbreak of measles. The child was sent away without operation, but developed measles and broncho-pneumonia, and died. Dilatation with intubation tubes was of great value if done early. He had a boy on whom high tracheotomy had been done in the country for urgent stenosis, and it was impossible to remove the tracheotomy tube. He did intubation and tried to feed him, but bronchitis set in, and the tube had to be taken out again, and a tracheotomy cannula again inserted. At the end of ten days the bronchitis had disappeared, and again intubation was done, and the child being regularly fed by a tube through the nose. Intubation tubes, several sizes larger than the one appropriate to the patient's age, were forcibly introduced so as to exercise over-dilatation. The patient did very well, and was now strong and hearty, ten years having expired since the treatment took place. As pointed out in Dr. Ball's book, intubation with tubes too large for the patient's age was very valuable to obtain sufficient dilatation to obviate the need of a tracheotomy tube. He would look forward with interest to the sequel in Dr. Hill's case.

Dr. ST. LAIR THOMSON said such cases were so rare that all who saw them should record their experiences. Now that tracheotomies were done lower down they were not so common. At the Belfast meeting it was a revelation to hear what was done by intubation in America. It was of no use putting in an intubation tube for a week or two, or putting it in only at night. Cases were reported in which such tubes had been worn continuously night and day for six months, twelve months, and two years. Though there was not much credit to be made out of such cases, it was a tremendous thing to restore a person so that he could gain his livelihood. Septic bronchitis was lurking at the back of all these cases, and sometimes the skilled physician did not diagnose it. An unfortunate little baby fell into the hands of a surgeon, and because there was stridor he examined with direct laryngoscopy, and thought he saw something below the vocal cords, but a laryngo-fissure revealed nothing. The surgeon left the tracheotomy tube in, and the child got worse. Then he proposed to the relatives that he should do laryngo-tracheostomy, and it was then that the child was taken to him (Dr. Thomson). There was evidently not enough air reaching the lungs, but he saw very little locally the matter; there seemed to be some thickening below the cords left by the laryngo-fissure. A physician reported that nothing could be made out

amiss with the lung. The child died suddenly in the night, and *post mortem* he found there was a horrible tracheotomy tube, with such a curve in it that it had irritated the trachea below the tracheotomy wound. The lungs were simply riddled with septic bronchitis, which had not been suspected. There was no temperature or cough or abnormal sound. There was evidence that laryngo-tracheostomy was, even on the Continent, falling into disuse. Of thirty-seven cases reported, six were dead—a mortality of 16.3 per cent.—and only fourteen were benefited. An operation which gave only such results did not seem worth developing.

The PRESIDENT said he feared that Dr. Hill had not heard much encouragement. But the case seemed to give hope of further improvement. He suggested Dr. Hill should see if the child could breathe with the external opening covered up. If the dilated process was not reduced sufficiently to last some days when the external wound was covered up, he did not suppose that any plastic operation would be likely to be successful.

Dr. HILL, in reply, said the front would be covered up before doing a plastic operation. The intubation tube had been taken out, as that method had been given a thorough trial. One could only get a silver probe down by the direct method, and he had had to put down bougies of increasing size in order to get the intubation tube in again. It was only in desperation that he did tracheo-laryngostomy, but he did not know that this operation had such a black record. He would show the case again.

CARCINOMA OF OESOPHAGUS.

By Dr. WILLIAM HILL.

Male, aged forty-five, was shown December, 1910, as (?) temporary local cure after six prolonged applications of radium salt to the cervical and upper thoracic oesophagus. He has had no application for four months, and there is now well-marked malignant ulceration lower down the gullet, 26 cm. from the incisor teeth; the lowest previous radium application made was 22 cm. from the incisor teeth. Further radium treatment will be carried out.

PERMANENT STYLETTED OVO-OESOPHAGO-GASTRIC TUBE WHICH HAD BEEN IN SITU FOR THIRTEEN WEEKS.

By Dr. WILLIAM HILL.

TWO CASES OF MALIGNANT DISEASE OF TONSIL, PHARYNX, AND TONGUE.

By Mr. P. R. W. DE SANTI.

CASE I.—Male, aged fifty-one. History of sore throat, pain in the left ear, and in swallowing, also loss of flesh for two to three months. Speech thick and impeded; noticed about the same time a swelling left side of the neck. Examination reveals inability to protrude the tongue equally; the left half being fixed more or less at its base. There is a hard, raised, everted mass over the left tonsil which affects the palato-glossal fold and extends to and into the tongue at its base on the left side; the growth

can also be felt to involve the lateral pharyngeal wall. There is a mass of hard, fixed glands in the submaxillary and upper cervical glands on left side of neck. The case seems to the exhibitor to hold out but little hope of cure from operation.

CASE 2.—Male, aged forty-nine. History of sore throat and swelling on right side of neck for four months, occupying the right anterior faucial pillar, right tonsillar region, and extending to and involving the base of the tongue. On the right side is a hard, malignant growth, ulcerated in parts. The disease extends to part of hard and soft palate on right side and passes down the pharynx laterally. The tongue is not protruded equally. There is a hard mass of infected glands in the neck. The case is of exactly the same nature as the other one shown.

The two patients are brought forward for opinions on the radium treatment, and how, if recommended, to get the treatment applied. The exhibitor's opinion is that radium will possibly improve, but not cure, the disease.

MR. DE SANTI said that neither of his cases were either well or happy; they both suffered much pain, the tongue was involved, there was pain on swallowing, and they were going downhill rapidly. He, like many others, wanted radium for the purposes of treatment, but could get none; there was none at Westminster Hospital. He did not think radium would cure the condition, but it might greatly alleviate it. His object in bringing the cases forward was to ascertain if any member could put him on to anyone who had access to radium and would be willing to apply it to these two patients. If they could get radium treatment, he would subsequently bring them before the Society.

THE PRESIDENT said many members of the Section had felt keenly the grave difficulty there was in getting radium for the treatment of these cases, and more particularly for poorer patients of the hospital class. It was a very grave want. He thanked Dr. Hill and Dr. Finzi for helping his own patient from the Bristol Royal Infirmary, who had assuredly received benefit. He hoped to show him at the Bristol meeting. It was particularly unfortunate if a poor patient came to London from a provincial town and the radium could not be applied, but perhaps more striking was the hardship for poor patients in London itself.

FUNCTIONAL APHONIA IN A BOY, AGED FIFTEEN.

By DR. L. HEMINGTON PEGLER.

Aphonia, three months' duration; no dyspnoea, cough or stridor; works in an atmosphere contaminated with irritating fumes. On examination the cords fail to approximate on attempts at phonation. There is, however, an absence of the stammering of the cords, familiar in female cases; they are deeply injected, otherwise appear healthy.

The case is shown owing to the infrequency of functional aphonia in the male. It resisted treatment by application of the interrupted current to the cords, but the voice has since returned under the application of liq. ferri perchlor.

DR. FITZGERALD POWELL said that it must be in the experience of most of the members that laryngitis was not an uncommon cause of "functional aphonia," quite apart from hysterical or neurotic functional aphonia.

DR. ST. CLAIR THOMSON said that in the *Proceedings* of the old

Society there was an account of the case of a soldier who had gone through the Boer War. Towards the end of the war he was thrown off his horse, and that extinguished his voice. Yet he was a robust man and courageous.

Dr. DUNDAS GRANT said the association of laryngitis with functional aphonia was not very uncommon. Sometimes the occurrence of the laryngitis in a nervous person occasioned such alarm as to cause the voice to disappear—a self-suggestive, or in other words, hysterical event. Sir Morell Mackenzie recognised the association, and said that before faradising a case of supposed functional aphonia one should make sure there was no congestion of vocal cords or laryngitis, simple or tuberculous. From catarrhal causes there might be impairment of the action of the internal tensors, and the treatment of the laryngitis was often the most important element in the case. Recently Dr. Grant had a case of marked aphonia, with return of voice after the use of the laryngoscopic mirror. There was, however, tuberculosis in the lungs and congestion of the vocal cords—undoubtedly an early stage of infiltration with tubercle.

A CASE OF LARYNGEAL TUBERCULOSIS IN A BOY, AGED TEN.

By Dr. W. JOBSON HORNE.

The PRESIDENT said that it was a question whether it was tubercle, and it would be well to see the case again later on.

Dr. DUNDAS GRANT said the one point against it being tubercle was its unilaterality. Otherwise the ulcer looked exactly like tubercle.

A CASE OF PERFORATION OF THE SOFT PALATE IN A WOMAN, AGED THIRTY-FOUR.

By Dr. W. JOBSON HORNE.

The PRESIDENT said it seemed to him that the perforation was due to a former gummy, but there did not seem to be so much cicatricial contraction as usual.

A CASE OF NASAL NEOPLASM IN A WOMAN.

By Dr. W. JOBSON HORNE.

A SIMPLIFIED INSUFFLATOR FOR THE APPLICATION OF POWDERS TO THE LARYNX, PHARYNX, NOSE, AND EAR.

By Dr. W. JOBSON HORNE.

MICROSCOPIC SLIDE SHOWING SECTION OF CYST OF TONSIL.

By Dr. W. H. KELSON.

Patient was a man, aged forty-three, sent up from the country with the diagnosis of sarcoma of the tonsil. He had suffered from repeated attacks of sore throat, and the left tonsil had been slowly increasing in size for some months; he had slight pain and some difficulty in swallowing. The left tonsil was found to be very much enlarged, firm, but

elastic; no enlarged glands. The tonsil was partially enucleated, and then the cold wire snare applied.

COMPLETE STENOSIS OF THE LARYNX FROM EPITHELIOMA IN A MAN,
AGED TWENTY-THREE.

BY DR. STCLAIR THOMSON.

Hoarseness was said to have come on suddenly while patient was in India in July, 1909. Admitted to Netley Hospital, March, 1910. He was then very hoarse: the whole larynx was enlarged, particularly on left side. No enlarged glands. Left vocal cord was fixed in adduction, and the posterior half and the left arytenoid were involved in the growth of an irregular tumour; no ulceration.

May 14, 1910: Tumour had grown to occupy more than half of the lumen of the larynx. After a low tracheotomy a laryngo-fissure was performed at Netley, and the left cord and tumour removed. On examination the tumour was found to be fibrous in character.

All reported to be well until June, when he had more attacks of choking, and the tube was re-inserted in the neck. Sometimes the patient had noticed swellings in left side of neck, and at those periods he could not swallow solid food. When admitted to King's College Hospital in October, 1910, the patient was wearing a small tracheotomy tube in the region of the crico-thyroid membrane, and apparently through the thyroid cartilage. Through this there was both inspiratory and expiratory stridor. When the tube was blocked there was no respiration through the larynx. Much cicatricial tissue was around the wound and along the scar in middle line. Great thickness and swelling of larynx, with tenderness, especially noticed in transverse diameter. Patient spoke entirely with the pharyngeal voice. Entrance to larynx was entirely occluded by the fixation of the arytenoids against the posterior surface of the epiglottis. No movements in arytenoids. Wassermann and von Pirquet tests were both negative.

October 14, 1910 (*vide* photo and radiogram): Under eudrenine, low tracheotomy was done and a large Durham's tube inserted, and a few days later the upper (old tube) was discontinued. Perichondritis extended in epiglottis and thyroid alae. The old tracheotomy wound never closed, and pus continued to ooze through it. Laryngo-fissure, but nothing fresh discovered. During exhibitor's absence in January, Sir Watson Cheyne evacuated an abscess in the left side of neck and re-opened the larynx and removed a piece of necrosed cartilage. The granulation-tissue removed at the same time is shown under the microscope.

This case and specimen were shown before the Medical Society of London, and several expert pathologists agree that it is malignant. Still, not only the age of the patient, but the clinical evolution of the disease appear quite opposed to the conclusions of the microscope.

It should be noted that there are no enlarged glands, and it is unusual for the larynx to be completely occluded by a malignant growth without any of it sprouting up through the glottis.

The PRESIDENT pointed out that the opinion of several expert pathologists was that the growth was an epithelioma. He would be glad to hear the views of members on the case, which presented many points of interest.

Dr. SCANES SPICER said the case was one of the most interesting

which had been shown before the Section. It raised the question whether perichondritis was the primary condition, or whether the case was malignant either at the beginning or even at the present time. The patient stated he was talking to some companions when his voice went *suddenly*, though it had been *perfectly well* before. He thought an arytenoid may have been dislocated, for the vocal cord appeared to have been fixed in adduction when he was examined at the hospital. Apparently the perichondritis started then, and septic invasion ensued, spreading over the remaining cartilages. There had been no ulceration and no enlarged glands — points somewhat opposed to the theory of primary malignancy. He asked what was meant by saying the tumour was "fibrous" in character. What was done in this case was a thyrotomy. An interesting question was whether this should not have been done before. In a discussion which was opened by Dr. de Havilland Hall some years ago he remembered Dr. Hall's statement that Sir Duncan Gibb had recommended that as the proper treatment of perichondritis of the larynx at an early stage, and that if there were any separated dead cartilage it should be removed by opening the larynx. On another occasion, under similar circumstances, one might entertain chondrotomy and early removal of sequestrum if it were found there was much destructive perichondritis with pus coming from the parts. He was even now dubious about the case being malignant. The structure of the specimen appeared to be that of epithelioma, but such appearances occurred in other conditions, such as chronic hyperplastic processes of epithelium, covered parts, erosions of the cervix uteri, and even in growing epidermoidal cells in blood-serum and on agar, etc. Numerous references to such conditions, and the authorities who had described them, could be found in Roger Williams's work on the "Natural History of Cancer," p. 173 *et seq.* Because a specimen looked like epithelioma it was not necessarily malignant.

MR. DE SANTI said he was very strongly of opinion that the case was not one of epithelioma. The slide under the microscope, with all due deference to the expressed opinions of the pathologists, did not appear to bear out the diagnosis of epithelioma. Clinically the general history and appearance of the man did not suggest malignant disease either. There was an absence of any glandular enlargement, and although there has been much ulceration and breaking down in and around the larynx, yet there was a total absence of any malignant ulceration. In some of these doubtful cases one had to rely principally on clinical evidences and experience in contra-distinction to the pathologist reports. For instance, in a case under his care a patient presented a large, hard, ulcerated, cauliflower-like mass growing from the external auditory meatus. It looked and felt like a typical epithelioma. The history was, however, a very short one, and there was a total absence of glandular infection. On further examination it was found that the patient had a hard chancre and a typical secondary rash. A piece of the growth was excised and sent for pathological report. At the same time the patient was put on mercury. When seen a week later the pathologist's report had come, and was "typical epithelioma," but the cauliflower-like growth was half the size, and subsequently entirely disappeared, and a similar kind of growth occurred in the opposite meatus. The case was one of syphilitic condylomata.

MR. TILLEY endorsed Mr. de Santi's remarks; it was very unlikely that the lesion was epitheliomatous, it looked more like chronic inflammation.

The PRESIDENT suggested the specimen be referred to the Morbid Growths Committee, as it was an intensely interesting one. The clinical aspects of the case made one think it unlikely that it was epithelioma.

Dr. ST. CLAIR THOMSON, in reply, said he had the patient's medical sheet sent from Netley Hospital, and it made no reference to typhoid. The man denied syphilis, and the Wassermann test was negative. There was no trace of tubercle in the lungs, and the von Pirquet reaction was negative. A low tracheotomy was done before the original laryngo-fissure was carried out. But a month after the latter he got stenosis, and a hurried tracheotomy was done, and the tube was left in three or four months. The man did not come under his care until four months later, and then he regarded it as septic perichondritis, and as such the man was treated in King's College Hospital from October to Christmas. On doing laryngo-fissure he found nothing in what had been his larynx. He had him rubbed with mercury and gave him iodide of potassium, and while he (Dr. Thomson) was away at Christmas an abscess developed on the left side, and Sir Watson Cheyne opened it: it led up to the thyroid. He showed him at the Medical Society, when several pathologists and surgeons said they could not disbelieve the section. He would be glad to submit the section to the Morbid Growths Committee.

AUSTRIAN OTOLOGICAL SOCIETY.

Meeting January 30, 1911; Monats. f. Ohren., year 45, No. 2

PROF. URBANTSCHITSCH *in the Chair.*

Abstract of Report on Proceedings.

A CASE IN WHICH A LABYRINTH FISTULA OCCURRED AFTER AN OPERATION FOR ACUTE MASTOIDITIS, AND IN WHICH COMPRESSION AND ASPIRATION AFFORDED VERTICAL NYSTAGMUS.

By R. BÁRÁNY.

A man, aged thirty-six: operation on the nose followed by bilateral mastoiditis. Left side healed spontaneously, but an antrotomy was required on the right. No fistula was detected at the operation: wound healed uneventfully; perforation soon closed, membrane became normal in appearance and the swelling in the meatus subsided. In four weeks' time, when the retro-auricular wound was almost healed, a sudden attack of giddiness took place. The range for whispers was five metres. Compression of the air in the meatus afforded a strong vertical nystagmus downwards and aspiration a very slight nystagmus upwards. Pressure on the scar over the site of the antrum evoked on the contrary a very slight nystagmus upwards, whilst on relaxing this pressure a strong vertical nystagmus downwards occurred.

The explanation of this peculiar reaction seemed possibly to lie in the assumption that the fistula was situated in the anterior vertical canal in the neighbourhood of its conjoint opening. Now pressure on the fistula itself, that is by pressing on the retro-auricular scar, produced a vertical

nystagmus upwards, which phenomenon must have been the result of a movement of the endolymph in the anterior vertical canal towards its ampulla and in the posterior vertical canal towards its non-ampullary end. With a fistula in the position suggested this movement of the endolymph would be the result of direct pressure on it. But why should the nystagmus be so weak? The direction of the current in the anterior canal under these circumstances would produce its weaker physiological influence, whilst the movement of the endolymph in the posterior canal would be only secondary to the primary movement in the anterior canal, and thus less strong. On the other hand, the effect of aspiration as induced by relaxing the pressure on the fistula would set up currents in the anterior canal which would produce its greatest physiological effect, and hence the more marked nystagmus.

The contradictory reactions of the fistula symptom by pressure on the scar and in the meatus appeared of especial importance, and on this phenomenon some light was thrown by the theory propounded by Herzog to the effect that movements communicated to the labyrinthine fluid by pressure on a fistula forced the fluid towards the windows. Thus, that pressure on the intact tympanic membrane produced a vertical nystagmus downwards, whilst the same reaction occurred on relaxing the pressure over the retro-auricular scar, could be explained by assuming that under these conditions the membranes of both the round and oval windows were driven inwards, and that then a movement of the endolymph in the anterior canal directed away from its ampulla took place. The significance of this reaction was that probably in the case of every fistula, either into or behind the antrum, the tympanic membrane and meatus being intact and the antrum excluded from the tympanic cavity, these conflicting conditions must arise if the air in the meatus be compressed — that is, the membranes of the round and oval windows will be driven in and the endolymph directed thence out of the fistula; or, if pressure be exerted over the fistula, the window membranes will bulge outwards. Bárány's attention had first been directed to these phenomena by Bondy.

As regards treatment in this particular case no further operation had been undertaken as the wound looked so well, and completely healed in some two months after the antrotomy. The patient remained under immediate observation, and further labyrinth symptoms could be dealt with should they arise.

A CASE, ALREADY SHOWN WHILST CONVALESCING, OF A NOW COMPLETELY HEALED, RIGHT-SIDED CEREBELLAR ABSCESS

By R. BÁRÁNY.

Since the wound had healed certain changes had taken place as regards the response of the vestibular centre to stimulation. Whereas previously rotation had afforded a very marked nystagmus lasting one minute, only a moderate reaction could now be elicited with a duration of only forty-five seconds. Also the caloric response on either side was now not so intense as before. Of still greater interest was the fact that the reaction movements of the upper extremities were now hardly detectable after rotation. Only after long-continued irrigation with quite cold water on the left side did deviation of the left upper extremity towards the left occur, whilst the right side was reactionless. With such alterations in response to stimulation it was almost impossible to obtain

information as to the past disease, and therefore one must be prepared to allow that, as the result of such adaptations to central lesions, localisation of past disease may become difficult in many cases. Bárány had been unable also in two other cases of cerebellar abscess, in both of which a labyrinth operation had been performed on one side, to obtain any reaction in the hand movements after the wound was healed. One of these cases was to be shown that day by Ruttin.

From a physiological point of view these alterations in reaction were most interesting, as they represented evidence of compensation. The very active response to stimulation of the vestibular system in cases where disease in the posterior fossa is in progress forms a very marked contrast to the weak reaction which can be obtained after such disease is healed.

A CASE IN WHICH THERE WAS A PROBABLE TRAUMATIC LESION OF THE LEFT CEREBELLAR HEMISPHERE.

By R. BÁRÁNY.

The patient was a man, aged forty, who some three months before had had a severe blow on the head followed by loss of consciousness, since when he had suffered with giddiness, headache, and loss of hearing on the left side. Examination on November 10 showed: Tympanic membrane normal, deafness of internal ear type, loud whisper, left at three metres, and right at five metres, varying spontaneous nystagmus to right and left, slightly increased by head-movements. Further—and this was most important—the left arm stretched out deviated gradually to the left, whilst the right was held steady, the eyes being closed, and the left wrist-joint also showed a spontaneous deviation to the left. After ten rotations to the left both the left and right arm, as well together with the wrist-joint, gave a strong typical reaction. After ten rotations to the right a typical deviation of the right arm and hand to the right took place, whilst no deviation at all occurred in the left upper extremity. After some days the reaction movement to the right recurred in the left arm, but the similar movement of the left wrist had till then not been obtainable in spite of the fact that with complete rest the subjective condition of the patient had very much improved, the headache, giddiness, and spontaneous nystagmus almost disappeared, and the range for whisper on the left increased to five metres. Bárány had seen already six or seven similar cases, in which the reaction movements in the upper extremities were lost subsequent to a severe injury to the head, and in which a constant correspondence existed between the more affected ear and the ipsilateral arm. Although the result of all these observations undoubtedly must be admitted to point to some lesion of the cerebellar hemisphere on the affected side, what exactly such lesion was he could not with any certainty state, but he submitted that such investigations should help considerably towards determining an accurate prognosis.

SUPPURATIVE LABYRINTHITIS, MENINGITIS, CEREBELLAR ABSCESS; OPERATION: CURE.

By E. RUTTIN.

Labourer, aged twenty-one: discharge from the right ear ten years; frequent attacks of giddiness the last eight years. Headache for eight

days, giddiness and vomiting for three days. Examination: Right ear, chronic middle-ear suppuration, large perforation with granulations, mastoid tender to pressure. Total deafness, no caloric reaction, no fistula symptom. Slight facial paresis and slight nystagmus towards the healthy side. Meningitis, temperature 38.5 F., pulse 76. Ocular fundi normal.

At the operation on the same day a putrefying cholesteatoma was found which had destroyed in part the mastoid process and posterior wall of the meatus. There was a pin-hole fistula into the horizontal canal filled with greyish-red granulations. The facial nerve lay exposed both in its descending and in horizontal portions. Oval window open. Labyrinth operation after Neumann with exposure of the posterior fossa. No fluid in the labyrinth. Fluid from all three portions of the spinal canal, purulent. The dura was freely incised.

The following day marked nystagmus to the sound side, which, after some nine days, slowly disappeared. On the tenth day severe occipital headache and marked nystagmus to each side, but especially towards the sound side. Patient apathetic, pulse 60, no giddiness. The latter nystagmus was attributed to some cerebellar stimulus, a condition which was corroborated by other symptoms.

The earlier incision into the cerebellum was explored and a definite abscess containing foetid pus evacuated. Up till September 1 the course was normal when Ruttin was away for a month, but about the beginning of October, whilst the wound was being dressed, spontaneous nystagmus to either side was noticed and the patient complained of headache. Temperature normal. Pulse 68. On further exploration another deeper lying collection of pus was found in the cerebellum and drained, after which convalescence was uneventful and the patient was discharged cured December 21, 1910.

The pus contained numerous masses of bacteria with streptococci and anaërobic bacilli; the spinal fluid was unfortunately not examined owing to an oversight.

A CASE OF OTITIC MENINGITIS RUNNING A REMARKABLE COURSE.

By E. RUTTIN.

A man, aged twenty-nine, had suffered four years ago from a left aural discharge for one month. All healed. For the last month the discharge had recurred, preceded by headache. Examination on December 24, 1910, revealed swelling, redness and bulging of the tympanic membrane sagging of the posterior meatal wall; labyrinth normal reaction.

No operation was performed till February 5, when the mastoid process was found filled with granulations but no fluid pus was present. All necrotic tissue removed down to healthy bone but neither the dura nor sinus thereby exposed.

Fever, which had not been present before the operation, was noted for three days, when it subsided without any other effect to the patient, but fourteen days later it recurred, accompanied by aphasia, headache and vomiting. All pointed, of course, to a temporo-sphenoidal abscess. Operation, however, discovered no collection of pus. Three days later the patient died, and at the autopsy a purulent meningitis of the convexity and base of the brain on the left side was found. With the exception of the two transitory rises the temperature had been subnormal

throughout, and was thus quite unusual for a case of purulent meningitis, being much more in accordance with a cerebral abscess.

ON THE QUESTION OF TRAUMATIC OTOSCLEROSIS.

By E. RUTIN.

A patient was shown, the subject of otosclerosis, in whom a history of injury seemed to bear a definite relation to the onset of the disease, and in addition a section from a case presenting all the symptoms of otosclerosis during life which had been attributed to injury some years before. Bony tissue was to be seen in the neighbourhood of the oval window, but more like callus than that usually regarded as typically otosclerotic.

ALEXANDER considered that the specimen did not show any callus, but was a typical section of otosclerosis. From his investigations he had seen cases of fracture of the petrous bone healed with fibrous tissue or with typical compact bone forming a callus.

FROSCHELS's experience had led him to regard injury as at times an aetiological factor in the production of the disease.

POLITZER did not consider the specimen one of otosclerosis.

TWO CASES OF TRANSITORY INFLAMMATION OF THE VESTIBULAR NERVE FOLLOWING INTRA-MUSCULAR AND INTRA-VEINUS INJECTION OF SALVARSAN.

By O. BECK.

A young girl, fourteen days after an intra-muscular injection, was sent to him complaining of giddiness. There was a weak but obvious left-directed vestibular nystagmus. Romberg's test afforded no typical reaction. The hearing and middle ear and the response to the caloric tests and rotation were normal on both sides. Two weeks later she had some so severe attacks of giddiness that she could not stand. The vestibule was now found quite unresponsive on the right side, whilst the hearing was normal and a marked left-directed spontaneous nystagmus existed. Gradually all the symptoms abated, and within fourteen days the right labyrinth responded normally.

A girl, aged ten, had an intra-venous injection, and six hours later complained of intolerable giddiness and vomiting. A typical paralysis of the vestibular nerve on the right side was found. On the next day the child was free from giddiness and felt quite well, the spontaneous nystagmus had ceased, and the labyrinth now reacted typically to all tests.

A CASE OF EXTREME DEAFNESS DUE TO HEREDITARY SYPHILIS CONSIDERABLY IMPROVED BY SALVARSAN.

By O. BECK.

A girl, aged eleven, "always deaf." Wassermann positive. Right ear totally deaf. Range for very loud conversation in the left ear 20 cm. Labyrinth on either side quite unresponsive to rotation or caloric tests. Five days after an intra-venous injection the hearing was much improved. Fourteen days later range of hearing at 1 metre, which condition was maintained up to the present time; one month after the injection right ear remained completely deaf and no vestibular reaction obtainable.

BILATERAL DESTRUCTION OF THE VESTIBULAR APPARATUS; RIGHT-SIDED DEAFNESS AND SEVERE DEPRECIATION OF THE HEARING ON THE LEFT AFTER SALVARSAN.

BY O. BECK.

On September 7, 1910, a man was injected with salvarsan for secondary syphilis. Five weeks later he noticed he heard badly in the right ear and on the day following dizziness and giddiness set in. On examination only sound-perception was found on the right side with total lack of response in the vestibule, whilst the vestibular symptoms had already almost subsided. Gradually the patient felt better with the exception of a diffuse headache which no drug would alleviate. On January 1, 1911, he had a most severe attack of giddiness accompanied by excessive vomiting, making rest in bed imperative. It seemed to him also that he heard worse in the left ear. Both vestibules were now found quite unresponsive. Spontaneous nystagmus of a vestibular character to the right. He walked with uncertainty and with the legs spread apart. The right ear was quite deaf, but the range for conversation and whisper was normal on the left. Since January 18 the hearing in the left ear also depreciated so that he could now only hear the loudest conversation at 20 cm. Wassermann always negative, nor did examination of the eyes or the rest of the nervous system afford any help.

All these symptoms certainly appeared after the exhibition of salvarsan, but whether they were really caused by it was not certain.

FREY, ALEXANDER, NEUMANN and BECK discussed the various points arising out of these cases at length. Sufficient evidence was forthcoming that such varying symptoms could undoubtedly be due to syphilis alone, especially in its earlier stages, and that this had not been more generally noted hitherto was owing to the fact that they were often transitory and that they had not been looked for. Allusion was also made to their probable dependence on changes in the consistency of the endolymph and perilymph.

Alex. R. Tweedie (trans.).

AMERICAN LARYNGOLOGICAL ASSOCIATION.

Thirty-second Annual Congress, held at Washington, D.C., May 3, 4, and 5, 1910.

JAMES E. LOGAN, M.D., of Kansas City, Mo., President.

(By courtesy of the *New York Medical Record*.)

Second Day—Wednesday, May 4.

(Continued from p. 274.)

LYMPHO-SARCOMA OF THE NASO-PHARYNX AND TONSILS WITH RESULTS OF OPERATIVE AND MEDICINAL TREATMENT.

BY DR. CLEMENT F. THEISEN (Albany, N.Y.).

Case I was a boy, aged fourteen, operated on under general anæsthesia, and then placed on arsenic carried to the point of tolerance. Coley's

serum was not used, as the author's experience with this remedy had been unfavourable. Temporary benefit resulted, but the boy had recently died. Case 2 was a man, aged forty-eight. The mass was removed from the left tonsil under cocaine and adrenalin, but recurred in the larynx, the original site remaining free from deposit. Arsenic seemed to keep the laryngeal recurrence stationary, and the man is now comfortable. Case 3 was a man, aged thirty-two, with a growth apparently confined to the right tonsil, and was removed by dissection of the right tonsil entire. The wound healed well, but it was too soon to predict the eventual outcome. Arsenic has apparently had a good effect.

VACCINE THERAPY.

Discussion.

DR. BIRKETT presented the following conclusions: (1) Vaccine treatment will sterilise the accessory sinuses of the nose when the subject of chronic disease. (2) The chronic discharge of mucus from the accessory sinuses is due, not so much to bacterial infection, as to habit-secretion. (3) The symptoms are due, not to infection, but to hyper-secretion and retention. (4) Although vaccine therapy is a valuable adjunct to treatment, the establishment of free drainage by the removal of polypoid masses and redundant mucosa is more important. (5) The cases of sinusitis, showing a tendency to become chronic, should be treated carefully by homologous vaccines.

DR. COAKLEY took a less hopeful view of vaccine therapy. His results had led him to the following conclusions: The bacterial flora of the sinuses consisted of the following organisms: *Streptococcus pyogenes*, *Micrococcus albus* and *aureus*, *Staphylococcus pyogenes albus* and *aureus*, and *Bacillus mucosus capsulatus*. The opsonic index has been unsuitable either as a means of clinical diagnosis or as a criterion for further treatment. The vaccinations made in varying strength have not been followed by the changes in the opsonic index which would be expected were this method of treatment one on which we could rely in practical work. The therapeutic results of his own cases were, in his own judgment, absolutely valueless. Before the use of vaccines the chronic cases had had frequently periods of improvement of the symptoms and periods of aggravation. In a few instances some improvement was noted after the first or second injection, but later the discharge and other symptoms returned as they had done under other plans of treatment.

DR. COBB had had good results in clearing up chronic ear discharges, but not such good results in nasal cases, although the anatomical conditions so far as closed cavities draining through narrow openings were concerned were apparently alike. In a series of atrophic rhinitis cases, however, the results were better. A bacillus of which he could find no description was found in pure culture in all cases. From it a vaccine was prepared, and injections varying in amount from one hundred and fifty million to five hundred million were made. A general improvement in odour, amount of crusts and discharge had resulted, yet in no instance could absolute cure be claimed. Before commencing vaccine treatment these patients were in the habit of using nasal washes, and this treatment was not changed while carrying out the injections except that before periodical examinations they were not allowed to use a douche for twelve hours. The patients themselves were enthusiastic over the results of

treatment. The same general degree of results had followed in sinus cases—improvement, but no absolute cure.

Dr. J. SOLIS-COEX had given thirty years ago the first injection of tuberculin ever made in Philadelphia. In one case he had succeeded in curing a man in whom not only injections of tuberculin were made, but the remedy was rubbed into the laryngeal ulcerations, and rectal injections were taken every night. He had always used the old tuberculin of Koch when he could get it.

Dr. W. S. CASSELBERRY said that up to this time the results of tuberculin on laryngeal lesions had been uniformly bad. He had seen, however, good effects in the larynx follow tuberculin injections even weeks and months after. He had reported elsewhere 40 per cent. of arrested cases in laryngeal tuberculosis, some of them having taken small doses of tuberculin.

ŒSOPHAGEAL DIVERTICULA.

By Dr. EMIL MAYER (New York City).

He presented the following conclusions: (1) Examinations should be conducted in a routine manner, the œsophagoscope being used last, bearing in mind always the danger of a rupture of a possible aneurysm; (2) In making the examination with the X-ray, the introduction of a small tube filled with shot might take the place of bismuth. (3) Œsophageal diverticula might be easily diagnosed. (4) Modern surgery offered much hope for these patients.

Dr. CHEVALIER JACKSON thought that the passing of a bougie was a more dangerous procedure than a skilful œsophagoscopy.

Dr. J. GORDON WILSON exhibited a specimen of a diverticulum in a young lion twenty months of age. It was one of the first instances of the kind known to occur in the lower animals. The lion had died in a choking spell. In addition there was a thickening of what Killian calls the sphincter muscle of the œsophagus.

THE CUTTING IN TWO OF A LARGE STEEL PIN WHILE TRANSFIXED IN THE LEFT BRONCHUS AND ITS REMOVAL BY LOWER BRONCHOSCOPY.

By Dr. W. E. CASSELBERRY.

The pin was glass-headed and about $1\frac{1}{2}$ in. long, and had been in position in the bronchus of a fifteen year old girl for about ten weeks, having caused in the first fortnight only a few spells of coughing with blood-streaked sputa. The X-ray, however, demonstrated its presence, although with some uncertainty, but the bronchoscope settled the matter. The pin was firmly fixed, and all efforts at removal with ordinary instruments failed, as it was impacted at both ends, and it was necessary to cut it in two, but the question was, how to prevent a portion from falling further down the bronchial tree when the division was made. So he had devised a beak-shaped scissor-like instrument so arranged as to avoid losing the smaller fragment by electing it to be held in the grasp of the pin-cutter. After the cutting the larger piece settled somewhat, but was easily withdrawn with a Jackson forceps.

Dr. CHEVALIER JACKSON referred to the statements with reference to the unreliability of a negative skiagram. We might get the history of a metallic body when it was not metallic and not dense enough to show.

We had frequently to make an examination in the face of a negative report.

Dr. T. H. HALSTED referred to a case of his own in which an attempt to remove a large brass-headed upholsterer's tack had resulted in the very accident referred to by Dr. Casselberry, namely, the loss of a fragment. The tack could be grasped with the forceps, but the head was so imbedded that it came off, and no amount of searching could discover the shank. It was thought it might have been lost in the subsequent vomitus. However, the child made an uninterrupted recovery.

Dr. EMIL MAYER said that to see a foreign body in a bronchus and to remove it were two different things. In one case in which the X-ray showed a tack in position quite plainly he could not see or feel anything with the tube as the foreign body had been so long in position that it had become surrounded by granulations, and was not protruding, so he felt that in view of the limitations of the case as to sight and feel of the body it would be harmful to the child's best interests to remove it. The child was perfectly well except that it was known that it had a tack in its bronchus.

Dr. C. G. COAKLEY referred to a case in his own practice in which a pin had been in a bronchus for a month when he was called to the patient. In spite of a tracheotomy and the dissecting away of a large thyroid gland, which bent the trachea from its normal course, he had been unable to remove the pin although he could see it and grasp it with the forceps. Finally, in a paroxysm of coughing it was dislodged and disappeared. It was located by the X-ray lower down. Dr. Jackson had seen this case, and it was the one referred to by the latter. He (Dr. J.) was unable to see the pin but could feel it, yet not extract it. In six months the patient developed an abscess of the lung followed by pneumonia, and then died. In this case such an instrument as Dr. Casselberry's might have succeeded.

Dr. R. C. MYLES referred to the extraction of a large needle from the larynx of a woman, in whom the foreign body lay across the larynx, and had finally torn itself loose under traction with a heavy forceps.

Dr. CASSELBERRY said, in closing, that it required a skillfully planned campaign to remove these impacted foreign bodies. It had taken him some two weeks to weigh and balance all the factors in his own case, but after these had been considered, his instrument devised, and removal attempted, the latter required but four minutes and a half.

EPITHELIOMA OF THE LEFT VOCAL CORD.

BY DR. CHARLES W. RICHARDSON (Washington).

The patient was a young man, aged forty, who developed a cold in October, 1908. Had hoarseness and a cough. Examination of the left cord showed it congested with some proliferation near the anterior commissure. Process looked more like a tuberculous than a malignant one. Four weeks of treatment relieved the symptoms, though not the local appearance, which slightly increased so far as proliferation was concerned. A small fragment revealed the epitheliomatous nature of the growth. A thyrotomy without the usual tracheotomy was done. The method employed for the removal of the growth was the usual sub-perichondrial one. Healing by primary union occurred, and was completed in about two weeks. When last seen thirteen months later there was no recurrence of the growth.

Dr. J. SOLIS-COREN said that as far as he knew the sub-perichondrial method was original with himself, and he had first performed it several years ago, the patient being still alive. He had at first applied tincture of benzoin to the denuded cartilage. Later he had used acid nitrate of mercury, thinking that there might be lingering deposits of malignancy.

Dr. W. L. BALLENGER had performed the same operation a year ago, and his patient was still well two months ago, with no recurrence.

Dr. T. P. BERENS had reported a description of a recent case of a man with epithelioma and a hoarseness of some five years' standing, in whom he had removed intra-laryngeally the whole anterior two thirds of the cord and found that his suspicions were confirmed. Finally he slit the larynx, having in mind to do the Cohen operation. He found that the periosteum was more adherent over the centre of the false cord, and removed the wing of the cartilage on that side. By applying a fenestrator to the wound surface of the mucous membrane he had a dry wound when cut through. In three days he was able to remove the tracheotomy tube, and his patient made an uneventful recovery from the operation. He now spoke with a very useful voice.

Dr. C. G. COAKLEY said that he wished he could report as good results as he had heard in this discussion. In a case of his own hemilaryngectomy was done, and later there ensued a contraction requiring the insertion of a tracheotomy tube. He did not believe that a total laryngectomy would prolong the patient's life, but a year ago the man was in very good condition.

Dr. H. L. SWAIN referred to a case of his own operated on now some three years ago without recurrence. Now the patient has a perfectly loud and clear voice. There had been added a cicatricial band filling the area formerly occupied by the true cord, which had been removed, and it had a free, clear edge, with some range of motion, so that the man had now a pretty fair pair of vocal cords.

Dr. D. BRYSON DELAVAN referred to the varying microscopical findings in superficial and deep portions of these laryngeal growths, saying that they often differed, citing an illustrative case. The specialist rather than the general surgeon should operate on such cases as were under discussion. He himself did not believe in the preliminary removal of a fragment for microscopical examination. The present discussion had completely proved the correctness of Dr. J. N. Mackenzie's position in this matter: everyone knew that the irritation of these growths was bad, but when it was admitted that the patient should be told to prepare himself for a completer operation very shortly after the removal of a piece of the growth for microscopical examination, the case was simply given away.

Dr. RICHARDSON, in closing, said that his patient had developed rather a hoarse voice. The band referred to by Dr. Swain was commencing to grow, and at his last examination was distinctly in evidence, and he supposed it would gradually develop more fully.

A CASE OF LARYNGEAL SYPHILIS.

By Dr. HARMON SMITH (New York).

The patient was a male, aged twenty-five, who, five years after the initial lesion, had an attack of laryngitis and shortly after had on his right vocal cord a soft polypoid mass about the centre which seemed to project from the ventricle. There was slightly retarded movement,

while the voice was strong, though husky. The case was regarded as specific in origin, but later developments and local changes led to a suspicion of either tuberculosis or malignancy. The points of differential diagnosis were passed in review. At no time during the observation had there been the appearance of any projection that would justify an attempt at obtaining a specimen for examination under the microscope. The patient's subsequent history had seemed to confirm the truth of the original diagnosis although there had been no evidence of an external destructive process which we regularly expected to find when a specific process had existed for a long period. Although all the true cord could be seen in the mirror it would undergo queer physical changes while being examined. It would seem to change from a normal condition to a puffy, redder and mucus-soaked look during phonation. This condition had been explained as a disturbance, probably vascular and lymphatic in nature.

FATAL CASE OF ASPHYXIA DUE TO PRESSURE ON THE TRACHEA AND BRONCHUS BY A TUBERCULOUS MEDIASTINAL GLAND.

By DR. C. G. COAKLEY (New York).

His patient was a girl, aged three, whose lungs revealed no lesion, but she suffered from dyspnoea, mainly on exposure, suggesting some growth in the sub-glottic region. Attempts at examination with the bronchoscope under chloroform anaesthesia led to cessation of respiration and the attempt was given up. A short time after an emergency tracheotomy was done under great difficulty as the child was struggling. Cocaine anaesthesia was employed. Death occurred an hour later. Autopsy revealed beneath the left tracheal mucosa an ovoid mass $2\frac{1}{2}$ c.mm. in length which encroached on the tracheal lumen to such an extent as to almost entirely occlude it. A nodule was found at the apex of the left lung. Microscopical examination of a portion of the lung nodule revealed the presence of lymphoid tissue in which there were numerous epithelial tubercles. The peritoneal glands were markedly enlarged and showed remnants of lymph-gland tissue, with closely massed epithelioid tubercles containing giant-cells but with no caseation. The centre of one nodule contained caseation and softening with leucocytic infiltration.

Dr. D. BRYSON DELAVAN had had a very similar case, the autopsy revealing a tuberculous lymph-node pressing on the trachea as well as general tuberculosis.

Dr. CHEVALIER JACKSON said that the case showed that we were gradually eliminating the things which used to be classed as status lymphaticus. In cases such as the one under discussion the alternating periods of free and obstructed breathing were very deceptive, and a tracheotomy ought to be done immediately. In one instance in which he had been called to see a child with dyspnoea he had passed a bronchoscope and found the bronchi obstructed with cheesy material. Tracheotomy was done, but the child lived only a few hours. Both lungs were found solidly tuberculous, while lymph-glands had broken down and filled the bronchi with the material found.

Dr. E. FLETCHER INGALLS reported the case of a child sent to him for removal of a foreign body from the bronchi, the symptoms being typical of this condition. The child was anaesthetised with a view to bronchoscopy, but died on the table. *Post-mortem* revealed a very large thymus.

Dr. J. SOLIS-COMEN asked Dr. Coakley to mention the character of the dyspnoea in his case. Was it supra-sternal or infra-sternal? With regard to thymus gland pressure cases he (Dr. Cohen) had seen instances in which the dyspnoea was immediately relieved as soon as incision was made through the thymus.

Dr. B. R. SHURLY referred to those cases of apparently laryngeal dyspnoea, seen before the days of bronchoscopy, in which the passage of an intubation tube gave no relief; an explanation of such cases was found in the one under discussion. The possibility of mediastinal disease in children was not sufficiently appreciated. There was as yet no classified definite symptomatology of these cases, but we might be helped in our diagnosis by the X ray.

Dr. J. PRICE-BROWN asked if such a series of causes and *post-mortem* findings might occur in adults?

Dr. COAKLEY said in reply to Dr. Cohen's inquiry that dyspnoea in his own case had been both inspiratory and expiratory, more expiratory. There was absolutely no cough, although the history of the case in the beginning suggested pertussis.

RECURRENT PAPILLOMA OF THE LARYNX EXTENDING OVER THIRTY YEARS, DURING WHICH TIME TWO THYROTOMIES WERE PERFORMED.

BY DR. FRANCIS R. PACKARD (Philadelphia).

The interesting points in the case were: (1) The long time during which the patient had been under observation, and throughout which intelligent treatment had been directed toward the relief of his condition; (2) the fact that throughout that period, practically as far as could be learned, there had been no change in the nature of the neoplasm; (3) the fact that this growth was so typical as to aetiology (followed a severe cold from getting wet), occurring in an auctioneer, as to progress and recurrence in spite of repeated removals, as to growth and microscopic appearance; and (4) as showing no tendency in spite of repeated operations and traumatism to undergo any malignant degeneration.

Dr. SAMUEL JOHNSTON referred to a case of a child in his own practice, in whom cure had been effected by applications of chloride of zinc.

Dr. D. BRYSON DELAVAN said that the types of papilloma mentioned by Dr. Packard and Dr. Johnson were altogether different things. In one of these recurring cases under his care the larynx had been split and kept open while radium was used. During the last three months there had been no recurrence. It was too early yet to predict the ultimate outcome.

Dr. C. W. RICHARDSON said that these recurring growths apparently reached a certain stage or limit of reproduction, and that if we kept at them until that time they would cease.

Dr. J. P. CLARK stated that in his experience with papilloma he had never known a similar case in which the growth had begun in early life. It was a matter worthy of notice that in the reader's case the growth had got begun until he was forty. In the case of treatment of the lesion in the larynx of the child it was hard to say just how much good treatment did, for papilloma would come and go as did the ordinary wart. When it got ready to go it went.

Dr. W. E. CASSELBERRY had seen a number of cases of papilloma

originating in a hult life. We could not divide these cases into merely two categories; he would rather say ten or more. They ranged all the way from the narrow circumscribed, base-pedunculated growth to the persistingly recurring growth filling the larynx. He advocated the use of the galvano-cautery for the destruction of the base. Much surface could be destroyed without any impairment of the cords.

Dr. W. K. SIMPSON had used lactic acid; in one case the recurrence had ceased with perfect restoration of the vocal cords and voice. He had come to the conclusion that lactic acid was one of the best escharotics we had.

Dr. H. L. SWAIN mentioned one case of recurrence in which he had been compelled to do a thyrotomy and burn out the base with the Paquelin cautery. Even after that the patient had had one or two small recurrences. He thought it better to avoid instrumentation if it was possible.

Dr. B. R. SHURLY had treated several such cases with tracheotomy and removal of all the growth possible. Ordinarily the putting of the larynx at rest was sufficient for recovery.

Dr. R. C. MYLES was an advocate of tracheotomy and putting the larynx at rest. There was danger of pneumonia after the more serious operations. Care should be taken not to remove the growths from opposite sites on both cords at the same time.

Dr. PACKARD said in closing that his patient, who was an unusually intelligent man, had urged him not to do any intra-laryngeal work if it could be avoided, as the growth recurred after every such procedure. The speaker thought it better to have a piece removed and to get out as much of the mass as possible if it showed malignancy.

BLACK TONGUE—LINGUA NIGRA VILLOSA.

By DR. CHARLES H. KNIGHT (New York).

He said that Blegvad had been able to collect 183 cases, including ten of his own in 1907. He passed in review the various theories as to the cause of the condition, quoting various authors, the persistence of the lesion, the variability of the symptoms, and the doubtful efficacy of treatment. He believed the malady to be innocuous, and that no apprehension of malignancy ought to be entertained. At present there was no evidence pointing to the existence of a causative organism. Blegvad had decided that the parasitic theory was not tenable. He thought that the reported cases called attention anew to the etiologic importance of the vasomotor system. In our study of germs and of the *role* played by the internal secretions the *role* assumed by the nerves in the causation of certain elusive and obscure affections might have been neglected. There seemed to be no necessity of entering upon an energetic therapy of the malady, although something might be done to relieve the mind of the patient. He closed by giving a selected bibliography of the literature of the subject.

OZENA AND RESPIRATORY GYMNASTICS.

By DR. MARCEL NATIER (Paris).

The author related a case of ozena occurring in a young boy who at an early age developed an acute attack of dysentery, but who as he grew

up developed an ozena also. Regulation of the diet and general sanitation were followed by regulated respiratory gymnastics, which led to a cure of the nasal malady. The author made a plea for a more careful investigation into the personal antecedents of this class of patients, saying that the ozenatous condition often followed and was directly referable to some disease of childhood, and said that there could be no plan of treatment applicable to all cases, but that each one ought to be considered by itself and treated accordingly. In this way the ozenatous condition would frequently disappear as the child grew up. To focus the therapeutic efforts on the nose alone was to commit a grievous error.

SUPPLEMENTAL REPORT ON OPERATIONS ON MALIGNANT GROWTHS OF THE UPPER AIR-TRACT.

By DR. J. PRICE-BROWN (Toronto).

Three cases of nasal sarcoma were reported on, the histories of which had been presented to the Association one year ago. In two of the cases there had been a return of the growth in the middle turbinate and upper part of the posterior naris. He followed again his electro-cautery method, under 20 per cent. cocaine anaesthesia, and in one case 40 per cent. when in the region of the sphenopalatine ganglion. The cases were still under treatment. The patients were regularly at work, and there had been no hæmorrhage after treatment. He never packed the nostril after operation. He thought it would be pernicious to take fresh sections for examination.

Abstracts.

PHARYNX.

Schubiger, Dr.—*Lateral Pharyngitis*. "Corresp.-Blatt. für Schweizer Ärzte," No. 2, 1911.

At a meeting of the Medical Society of the Solothurn Canton the author read a paper on this condition, which he regards as a localised affection of the mucous membrane covering the salpingo-pharyngeus muscle on either side, which comes into abnormal prominence when the seat of inflammation and during retching. The symptoms produced are considerable discomfort, and the feeling as if a foreign body were lodged in the larynx rather than in the pharynx, and often particularly localised to the site of entry of the superior laryngeal nerve through the hyo-thyroid membrane. He suggests for treatment the application of trichloroacetic acid or snipping through the "band" with scissors, having first determined by means of a probe if the symptoms are referable to this area and not to the tonsils or naso-pharynx, etc.

The ætiology, the writer considers, "does not differ from that of ordinary pharyngitis," and the only prophylactic measures emphasised are those directed towards nasal breathing both awake and asleep. The paper adds nothing new, though one would have welcomed a more detailed account of his cases of this condition, which is by no means always so readily responsive as Schubiger suggests. *Alter. R. Tweedie.*

Thomson, J. J. (New York).—*A Fatal Case of Quinsy in an Adult.* "Laryngoscope," December, 1910, p. 1124.

The patient was a healthy man, aged eighteen. The family doctor, having made a diagnosis of quinsy, incised the right side of the pharynx five days after the onset of the illness and evacuated some pus. As this did not afford much relief an unsuccessful attempt was made to incise the left side also. In order to relieve the patient's distress $\frac{1}{8}$ gr. morphia was given hypodermically. Respiration at the time was "difficult," but not stridulous. Three hours later he died before the author, who was hastily summoned, could reach him. *Post-mortem* incision of the anterior faucial pillar on the left side gave vent to about a drachm of pus, and an opening was discovered behind the posterior pillar, through which about six drachms of pus was expressed. A like quantity was evacuated from behind the right tonsil, and about an ounce from a retro-pharyngeal abscess. Further examination was not permitted, and the cause of death was not ascertained.

Dan McKenzie.

Crockett, Eugene A.—*When shall we Remove Tonsils and what Type of Operation shall we do?* "Boston Med. and Surg. Journ.," March 23, 1911, p. 414.

The author deprecates the wholesale removal of tonsils. He advocates the removal of tonsils (1) in all cases presenting large non-adherent tonsils largely filling the cavity of the pharynx, because of the obstruction to breathing, their possible interference with nutrition, and to secure proper jaw development at the period of the second dentition; (2) in cases associated with enlarged cervical glands and articular rheumatism where the tonsil is probably an aetiological factor; (3) in all cases of repeated peritonsillar abscess. As regards the type of operation, enucleation is to be preferred, especially in groups 2 and 3. In simple hypertrophy devoid of symptoms, the author thinks tonsillotomy is sufficient. Some remarks upon post-operative hæmorrhage conclude the paper.

Marleod Yearsley.

Blegvad (Copenhagen).—*Tonsillectomy.* "Arch. f. Laryngol.," vol. xxiv, Part I.

In cases of simple hypertrophy of the tonsils in children the writer considers the ordinary "amputation" by guillotine or snare sufficient. In all other cases where the tonsils have given trouble, especially in those of small hidden diseased tonsils and of tuberculous adenitis colli, the operation of tonsillectomy is absolutely required. The principal object of this paper is to recommend the use of a special modification of Pyncheon's tonsil forceps and of an improved form of Peter's snare. Risk of bleeding after tonsillectomy, if the snare be employed, is probably less than after tonsillotomy. In adults the operation is performed under local anaesthesia.

Thomas Guthrie.

Koffler, Karl—*Our Experience as Regards Tonsillectomy.* "Monats. f. Ohren.," Year 45, No. 3.

The paper relates to some 150 cases in which this operation was performed from the middle of 1909 up to date. The procedure was considered indicated only in those cases in which the tonsils were the source of continuous trouble and unresponsive to conservative methods of treatment. Amongst the indications may be cited repeated attacks of angina, the formation of peritonsillar abscesses, and the presence of foul secre-

tions in the tonsillar crypts. Many cases of acute and chronic rheumatism of the joints, endocarditis, sepsis of an obscure nature, nephritis and appendicitis, as is well known, states the author, are attributable to disease of the tonsils, to which Emerson adds one of poliomyelitis, and Koffler himself has seen another. The youngest patient on whom this operation was performed was seven years and the oldest fifty-seven. In singers and voice users tonsillectomy may cause serious alteration in timbre, etc. (Sequelæ at times found in association with other operative procedures on the tonsils, etc., whilst the causal relation of tonsillar disease in the above category would seem to require stronger support). Great care was taken to exclude unsuitable cases, such as patients the subject of hæmophilia, and to have the mouth in as healthy a state as possible prior to operating and so on, from which the author attributes the fact that no unfavourable complications occurred when these precautions were observed, but frankly gives an account of two cases where their omission caused trouble. The first referred to a woman, aged thirty-two, treated in the out-patient department, and who on account of severe bleeding was admitted the same evening. This was satisfactorily arrested and she was allowed up the next day, on the evening of which, however, she suddenly fell down and almost at once expired. At the autopsy a compensated mitral stenosis and status lymphaticus were found. The second case also was a woman, aged thirty-two, the subject of "chronic nephritis and endocarditis." Here, again, severe bleeding necessitated admission direct from the out-patient department, and, after continued and varied applications of pressure and hæmostatics, was eventually controlled by ligation of the right external carotid.

Local anaesthesia was usually adopted and some three or four injections in and around the tonsil of a 1 to 2 per cent. solution of novocain with an adrenal extract were found sufficient; general anaesthesia was reserved for nervous or excitable patients. With the exception of the one fatal case quoted Koffler regards all the cases as much benefited by the operation.

Alva R. Tweedie.

NOSE.

Schaeffer, J. Parsons.—*The Sinus Maxillaris and its Relations in the Embryo, Child, and Adult Man.* "Annals of Otol., Rhinol., and Laryngol.," vol. xix, p. 815.

A long and careful monograph, profusely illustrated, and the findings of which are embodied in twenty-two conclusions, of which the most important are: (1) The size of the cavity is but little influenced by dentition, progressing *pari passu* with the age of the child. (2) It reaches its full size from the fourteenth to the eighteenth year. (3) The capacity of the sinuses studied ranged from 9.5 c.c. to 20 c.c., the average being 14.75 c.c. (4) The sinus floor is lower than the nasal floor in the majority of cases. (5) The number of teeth in direct relation to the sinus is inconstant. (6) Adult sinuses vary much in size in different individuals and asymmetry in the individual is often marked. (7) The ostium varies much in size and may be duplicated: the accessory ostium is frequent (43 per cent.). (8) Examination of the fronto-maxillary relations showed that the sinus acts as a reservoir for fluids coming to the dorsal end of the infundibulum (the ostium maxillare being patent). (9) Frequently the uncinate process by a superior

curving causes the infundibulum to end in a pocket so situated as to direct fluids into the sinus.

Macleod Yearsley.

Coakley, C. [G.]—*The Association of Suppurative Disease of the Nasal Accessory Sinuses and Acute Otitis Media in Adults.* "Amer. Journ. Med. Sci.," February, 1911.

Of a series of cases of acute otitis media, 81 per cent. had sinus disease, and of cases of acute sinusitis, 42 per cent. had acute otitis media. The likelihood of a causal relation between the two is strengthened by the fact that they were usually found to be on the same side.

Macleod Yearsley.

West (Baltimore).—*A Window-resection of the Naso-lacrimal Duct in Cases of Stenosis.* "Arch. f. Laryngol.," vol. xxiv, Part I.

The operation here recommended is a modification of the Killian-Passow method. The latter consists of the removal of the whole nasal wall of the naso-lacrimal duct, and necessarily involves the sacrifice of the anterior portion of the inferior turbinal. The author's method consists in making an opening (under local anæsthesia) into the duct above the inferior turbinal, thus leaving the latter intact. The operation has been performed in seven cases, of which five have been completely cured and two improved.

Thomas Guthrie.

(1) **Brown, Geo. V. J.**—*The Effect of Maxillary Readjustment upon the Development of Nasal Chambers and Face.* "Annals of Otol., Rhinol., and Laryngol.," vol. xix, p. 885.

(2) **Black, Nelson M.**—*Widening the Dental Arches in Nasal Stenosis; Its Results and Possibilities.* *Ibid.*, p. 933.

The two papers require to be taken together. Brown considers whether direct improvement of intra-nasal conditions can be effected by treatment of dental and maxillary conditions, and, if so, how may it best be accomplished. He discusses the developmental principles underlying the question and the effects of adverse muscular action. He demonstrates the practicability of improving nasal deformities by separating the maxillæ and directly increasing the size of the nares, and then proceeds to demonstrate that arrest of growth in width across the palate can cause deviated septum, contracted nares, or even complete nasal stenosis. He compressed the palates of eight-week-old pups by wire, so as to reproduce as nearly as possible the maxillary condition of mouth-breathing children, one control pup being kept. At the end of six months the puppies were killed, the heads frozen, and sections cut, reproductions of which are given. The control-puppy thrived, the others became emaciated, and their noses showed stenosis, deviation of the septum, etc.

Black deals specially with septal deflections and the objects to be obtained in correcting them. He considers that the dental arch can be widened for a deformed septum accompanied by dental irregularities up to middle life, and cites one good result in a woman, aged thirty-three. Results in children with commencing nasal stenosis appear to be very marked. The author considers to be answered in the affirmative the question which he puts thus: "Given a case in which we have insufficient space for proper nasal breathing, with an arch with seemingly perfect occlusion, is it our duty and have we the right to alter the shape of the maxillæ and re-arrange the occlusion to allow the nose to properly functionate?"

Macleod Yearsley.

LARYNX.

Curtis, M.—*Primary Arytenoid Abscess.* "Annales des Maladies de l'Oreille, du Larynx, du Nez, et du Pharynx," October, 1910.

A woman, aged twenty-two, by trade a furrier, complained of acute pain on deglutition and very marked dyspnoea. There was nothing of note in her family history. She had never before suffered from her throat. No history of syphilis. The onset was insidious. Pricking sensations were at first experienced very low down on the right side of the neck, which were shortly afterwards succeeded by severe pain on deglutition and deep respiration. Lancinating pains were also felt radiating up to the right ear. Deglutition became almost impossible, save for fluids. Spontaneous pain was absent. At the commencement of the second week the temperature rose slightly and the voice became raucous, at times bi-tonal and finally aphonic. The general health was good. Laryngoscopic examination: The right arytenoid was swollen, red, and oedematous; it extended backwards and also overhung the glottis, but not to the extent of interfering with the breath-way. The right vocal cord, normal in colour, was stationary in the middle line. The left cord was in every respect normal. Anterior rhinoscopy revealed enlarged inferior turbinated bodies. There was partial nasal obstruction. Posterior rhinoscopy showed that the nasopharynx was slightly congested. After anaesthetising the arytenoid with cocaine, it was incised with the galvano-cautery over its most prominent part; thick yellow pus escaped and the abscess cavity was partially emptied. Microscopic examination of the discharge revealed the presence of diplococci and streptococci. On the following day deglutition became possible and the voice returned to some extent. Laryngoscopy showed that the arytenoid was much reduced in size, less red, and that the right cord was slightly mobile. The lungs and heart were normal and there had been neither sugar nor albumen in the urine. The author remarks on the rarity of arytenoid abscesses. Usually the local infection is preceded by a general one: pneumonia and influenza are often followed by benign laryngeal abscess. At other times abscess formation has been a sequel to acute laryngitis or the inclusion of foreign bodies in the mucosa, e.g. fish-bones, etc. In the present case the writer holds the vitiated atmosphere in which the patient worked responsible for the infection. Finally, attention is drawn to the fact that the abscess was submucous, and that the perichondrium was not involved, as was evidenced by the rapid return to normal of the affected region.

H. Clayton Fox.

McCardie, W. J.—*Death due to Inspiration of Gummulous Material from a Gumma which had Burst during Chloroform Anaesthesia.* "Proc. Roy. Soc. Med." (Anaesthetic Section), March, 1911.

The patient, male, aged forty-three, suffered from hernia of the testis, and also from bronchitis. Chloroform was administered by the house-surgeon, and the patient was nervous and struggled. During the act of lifting the patient on to the operating table the face became suddenly cyanosed and respiration stopped, although the pupils were normal, the corneal reflex active, and the pulse easily felt. In spite of tracheotomy and artificial respiration the patient died. *Post-mortem*, a broken-down gumma was found at the bifurcation of the trachea, and the main bronchi on both sides were blocked with pus.

J. S. Fraser.

Koenig, C. I. (Paris).—*Treatment of Singers' Nodes and other Eeerescences of the Cords by Galvano-cauterisation: "A New Guarded Cautey."* "Annales des Mal. de l'Oreille, du Larynx, du Nez, et du Pharynx," November, 1910.

The author considers removal of singers' nodes and polypoid excrecences by the galvano-cautery preferable to ablation by forceps or the double cirette. By this method the amount of tissue removed can be more exactly gauged. Moreover, the sealing of the vessels and lymphatics does much to prevent post-operative infection. He works with a specially constructed cautery-burner. The platinum is for the most part protected by a sheath of copper, but at one point projects through the sheath in the form of a bead, which constitutes the cautery point. When the current is on this bright little sphere stands out prominently against the copper background under reflected light, greatly facilitating precision during operation.
H. Clayton Fox.

TRACHEA AND ŒSOPHAGUS.

Large (Second H.).—*Some of my Mishaps in Seventy-five Cases of Tracheo-bronchoscopy and Œsophagoscopy.* "Laryngoscope," November, 1910, p. 1050.

Four fatal cases are reported:

(1) Child, aged eighteen months, inhaled the kernel of a pea-nut. Owing to delay the patient was *in extremis* before any attempt was made to remove the foreign body. Removal was rapidly and successfully accomplished, but the child died.

(2) Child, aged two. Diagnosis of foreign body in the bronchus made from the physical signs in the chest. Upper bronchoscopy was tried and the foreign body seen, but it was too large to enter the tube. A low tracheotomy was then performed, and the foreign body, a bean, removed. The child was suffering from pneumonia at the time of the operation, and died some hours later. Like the first case the fatal issue would have been avoided if the child had been seen earlier.

(3) An Œsophageal case in an adult. The patient was only able to swallow liquids, and that with difficulty. Cancer was diagnosed, and the Œsophagoscope was passed in order to obtain a specimen for examination. The piece of "growth" removed was found to consist of lung-tissue. The patient died twenty-four hours later. A *post-mortem* was not obtained. The author used no pressure in inserting the tube, and is unable to explain why he got lung-tissue, unless the carcinoma had ulcerated through into the lung.

(4) Child, aged eighteen months, with a penny in the Œsophagus just below the cricoid. The author tried to pass the Œsophagoscope, but the opening of the Œsophagus was very tight and hyperemic, and as he feared to use force the attempt was given up. Œsophagotomy was resolved upon, but the child died before the operation.

In cases of foreign body in children the author follows Jackson's rule of first attempting removal without any anæsthetic whatever, local or general. The article concludes with several valuable practical hints.

Dan McKenzie.

EAR.

Yearsley, Macleod.—*Rosenmüller's Fossa and the Middle Ear.* "The Hospital," February 11, 1911.

A short clinical lecture drawing attention to the importance of the lateral recess of the naso-pharynx in diseases of the middle ear. The conditions which may occur in Rosenmüller's fossa are pointed out: (1) The occurrence of "soft" adenoid masses, keeping up chronic inflammation in the Eustachian tubes, and mechanically interfering with the action of the tubal muscles and the venous return from the tympanum; (2) the presence of bands and adhesions; (3) the presence of small, irregular, scattered masses of adenoid tissue.

Author's Summary.

Drury, D. W.—*Double Otitis Media; Dehiscence of the Floor of the Cavum Tympani; Streptococcic Meningitis.* "Boston Med. and Surg. Journ.," March 2, 1911, p. 308.

Infant, aged nine months. Both membranes bulged and were incised, the right paracentesis resulting in profuse hæmorrhage, controlled by plugging. At the *post-mortem* it was found that the floor of the middle ear was absent, the jugular bulb mounting into the cavity. The petro-squamosal suture was open.

Macleod Yearsley.

Lannois and Jocod (Lyons).—*Ozenatous Otitis.* "Annales des Maladies de l'Oreille, du Larynx, du Nez, et du Pharynx," October, 1910.

The authors believe middle-ear complications to be of frequent occurrence in atrophic rhinitis. Exception has, however, been taken to this view by Michel, Loewenberg, and later by Jurasz, who found only twelve cases with otitic lesions in 170 patients. On the other hand, Zaufal found aural complications in 80 per cent. of cases, and Morf in 47 per cent.—an experience closely agreeing with the writers' estimate of 50 per cent. The lesions met with are: acute middle-ear inflammation (simple or complicated), the dry and adhesive varieties, and that which forms the subject of this paper, designated by the authors "ozenatous otitis." This form is for the most part insidious in its onset, chronic in its course, and possesses special clinical features. The exudate, which is scanty, concretes into greenish-grey crusts, having a typical ozenatous odour. The onset may be acute and spontaneous, or may complicate an infectious disorder, measles, etc.; there is no pain, and instead of clearing up the otitis lapses into a chronic state. But the majority of cases set in insidiously, and the first complaint of the patient concerns functional troubles. On examining the ear one finds more or less impairment of hearing, and a discharge from the meatus having special characters. Lavage does not bring away any mucoid threads, but the return fluid is turbid and contains epidermic pellicles, greyish lamellæ, with cerumen mixed with pus; the odour of the fluid is identical with that of nasal ozena. The tympanum is occupied by crusts, which can only be removed after daily applications of oil and repeated syringing. When a view of the middle ear is possible grave lesions are always observed; sometimes the membrane has been entirely destroyed, the mucosa may be red and granulating, but is usually atrophied, and one sees patches of epidermisation on the inner wall. Polypoid formations are rare; when present they assume the papillomatous form, and frequently become detached during lavage. The naso-pharynx and

Eustachian cushions are carpeted with crusts. With regard to the bacteriology of the affection the authors have failed to isolate any particular organism, owing to the composite nature of the infection, but they have reason, from clinical analogy, to infer that the causal agent is common to the nose and ear. The prognosis is favourable, provided that the nose, naso-pharynx and ears are treated simultaneously.

The indications in treatment are to cleanse the tympanic mucosa, to check exudation, and deodorise the ear. Crusts are detached by hyd. peroxide or mentholated oil. The authors especially advocate the application of liquid paraffin containing 20 per cent. essential oil of birch, which acts as a rapid deodorant and checks crust formation.

Five cases illustrative of the various phases of this affection are given. H. Clayton Fox.

Reik, H. O. — *Secondary Efforts to Hasten Healing after Mastoidectomy*, "Boston Med. and Surg. Journ.," March 23, 1911, p. 417.

The author commends the blood-clot dressing method. That proposed in this paper is an *alternative* and *secondary* measure. The author tries for primary union and has 75 per cent. of successes. Failure of the blood-clot method is due to the toxic or lethargic condition of the patient or to defective technique. The secondary measure here advocated consists in re-opening, clearing out all granulation-tissue, freshening the wound, and suturing. The advantages claimed are: the saving of at least a month for healing; saving of discomfort for patient and trouble for surgeon; substitution of a linear scar for an unsightly one with more or less depression. Macleod Yearsley.

REVIEWS.

The Medical Annual, 1911. Bristol: Wright. London: Simpkin, Marshall, Hamilton, Kent & Co.

"The Medical Annual" has this year lost nothing of its brilliance, and, indeed, it has almost surpassed itself. In regard to our own specialities, diseases of the ear are treated by Drs. Milligan and Sewell, and they may be depended upon to have overlooked nothing of great importance or interest. Among the abstracts of various papers are some which are of the less common-place type, such, for instance, as one by Steinochneider on the permeability and absorptive capacity of the tympanic membrane and external auditory meatus, and one by Fröschels on what is described as a new symptom in cases of otosclerosis, namely, abnormal tolerance to touch in the external auditory meatus. The readers of Politzer will remember that in cases of otosclerosis wasting of the nerve-fibres in the middle ear was one of the pathological features, and many writers have referred to the relative anaesthesia found in this disease; indeed, one writer fancifully described it as being due to a lesion of the nervous system situated between the nuclei of the auditory and of the fifth nerves. The writer of this review has referred to the observation that this anaesthesia may show itself as an unconsciousness on the part of the patient that the air on politzerisation has entered the tympanum, while

nevertheless, he has, by the auscultation tube, convinced himself that the entrance thereof was complete. As the abstractors say, the matter needs further investigation. A case of latent streptococcal infection of the mastoid described by Sidney Scott is narrated, and reference is made to two cases reported by White, in which the matrix of a cholesteatoma was left undisturbed in order that its epidermis might serve in covering the bony cavity. Barr's important paper on the non-operative treatment of tinnitus aurium is very fully abstracted, as is also Lake's report on the operative treatment of this condition. The vestibular tests receive a due amount of attention without leaving too little space for other matters. The present-day treatment of otitic meningitis, as carried out by Dench, Wittmaack, and Logan Turner will be found instructive.

The main articles on diseases of the throat and nose have been confined to the same specialists, and they will be found equally comprehensive and satisfactory. The nose and its sinuses are treated within smaller limits than in the past few years, in accordance with the fact that comparatively little of importance that is new has been added during the past year. The tonsils have sprung into new and increased eminence, especially through the enterprise of our American brethren, but a very fair account of the present position of the "tonsil problem" will be found in the abstract of Dr. Milligan's own paper on some practical points in the surgery of the tonsil.

The larynx has not over-much material, almost the only paper referred to being one on the injection of alcohol into the superior laryngeal nerve in the treatment of the severe dysphagia so frequently present in cases of laryngeal tuberculosis. Much of importance and novelty is reproduced in the abstract of Roe's paper on the treatment of palatopharyngeal adhesions. Several articles of the greatest interest to us are contributed by Priestly Leech. Among these may be mentioned one on the surgery of the œsophagus, especially diverticula, some valuable means of diagnosis and measurements being described. The œsophagoscopic treatment of cancer of the œsophagus scarcely receives as much notice as it is likely to have in the next issue, it being said, however, that its introduction is likely to lead to better results in cancer of the cervical portion. Mr. Morriston Davies's important paper on the surgical treatment of this disease is very appreciatively and fully abstracted. Among the less special subjects there are many of particular interest to us, such as "606," vaccines, X-ray, radiology and electro-therapeutics. New methods of operation, having for their object the cosmetic treatment of facial paralysis deformity, will be found worth noting. In regard to optic neuritis, dealt with by Dr. A. Hugh Thompson, great interest has obviously been excited among oculists and neurologists by Barr and Rowan's investigations as to the frequency with which optic neuritis occurs in purulent diseases of the middle ear. None of us can afford to be behindhand in regard to tuberculosis, Dr. Joseph J. Perkins dealing with it from the medical point of view and Mr. Priestly Leech from the surgical. The former, a most unbiassed observer, states that there is a growing body of opinion in favour of the use of tuberculin in treatment, and he analyses with great thoroughness the report of results derived from its use in various sanatoria. Dr. Purves Stewart contributes various articles on nervous diseases, one on tuberculous meningitis in adults being particularly important; lumbar puncture as a palliative receives approval. Diphtheria, vaccines, angina, are very advisably entrusted to Dr. Goodall, among the most important and newer points being the method of dealing with "contacts" and "carriers," as is also the section

on anaphylaxis which is coming so much to the front in connection with the serum treatment of diphtheria and other diseases.

One of the special novelties in this year's issue is a richly illustrated chapter on the diagnosis of morbid tissues carried out in a schematic way which will make it of great value to those practitioners who have aspirations in the direction of pathology. Some very practical instructions are given, but it is to be hoped it will not lead the too self-sufficient to abstain from consulting the more highly trained and specially equipped histologists. We are pleased to think that in most instances the tendency will be to excite a more general interest in morbid tissue diagnosis and lead to more frequent reference to the recognised authorities.

The descriptions of appliances, the lists of books, of medical institutions and of legal decisions go, as usual, to make the work not merely desirable but practically indispensable.

Dundas Grant.

Photographic Atlas of Radiography of the Mastoid Region and of the Nasal Accessory Sinuses. By JOSEPH BECK, M.D. St. Louis: The Laryngoscopic Company, 1911.

In all the Atlas contains thirty-three plates. Of these four are stereoscopic photographs showing the position of the patient, plate and lamp favoured by the author, for the purpose of radiography of these regions.

The first three radiograms of the skull are stereoscopic, showing the accessory sinuses and mastoid cells, etc. A stereoscopic diagram is introduced to illustrate the difference between pseudoscopic and stereoscopic pictures. Then follow three large radiograms, showing the skull in the postero-anterior position, the lateral position, and the mastoid position. Although the position suggested has many advantages from the radiographer's standpoint, we find that it is often particularly trying to patients suffering from sinus suppuration, and there is no doubt that the erect posture and even the supine is more comfortable than the prone in most cases. The succeeding ten plates are radiograms of the normal head in various positions, which, like all the radiographic plates, are accompanied by descriptive diagrams which teach the beginner how to interpret the lines and shadows of the radiograms. Three of these are specially interesting in showing the mastoid cells.

Up to this point all the plates are of value in educating the eye to appreciate the anatomical import of the shadows of radiograms of the head, and are from that aspect most useful, since it is impossible to interpret radiograms of patients whose sinuses are anatomically abnormal, absent or diseased, unless the observer is conversant with the appearances presented by the normal and healthy structures.

We now turn to the plates which are of more immediate interest from the clinical standpoint, being radiograms of (1) chronic suppuration with cholesteatomatous cavity, showing a distinct outline of the lateral sinus; (2 and 3) from the same patient, showing on one side a diploic, and on the other a pneumatic mastoid; (4) acute frontal, ethmoidal and antral inflammation (unilateral); (5) the same two weeks later following recovery; (6) chronic frontal, ethmoidal and antral disease (unilateral); (7) chronic pan-sinusitis; (8) acute mastoiditis (early); (9) the same, a week later; (10) a large-celled pneumatic mastoid (normal); (11) acute mastoiditis (post-operative); (12) sclerotic mastoid.

The radiograms are all very good; indeed, our experience is that even a very good and useful radiographic plate may appear poor when printed;

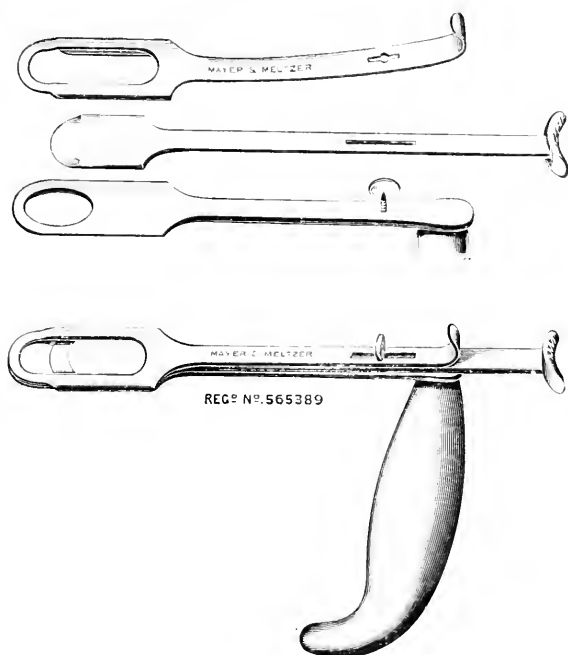
hence the author has been unusually successful with his originals, presuming the plates represent in any way his average results; and we may congratulate him on the production of a radiographic atlas which records excellent work and will be of very considerable service to practitioners in interpreting radiograms of their patients who are suffering from purulent sinusitis or mastoiditis.

P. Watson-Williams.

NEW INSTRUMENTS.

A SIMPLIFIED ASEPTIC MACKENZIE GUILLOTINE DEvised BY
MR. HUGH E. JONES, F.R.C.S.

In spite of the many modifications and improvements which have been



made from time to time in Mackenzie's guillotine, some of its defects have been retained in one or other pattern and some are common to all:

(1) The difficulty of cleaning the groove and slot along which the blade passes.

(2) The large number of parts, some of which were small, easily detached and easily lost.

(3) The dependence of the instrument for its proper working upon two screws, the threads of which rapidly wore out, and the fact that these defects usually became manifest during an operation.

The writer has devised an instrument in which these defects have

been entirely eliminated. He is indebted to Messrs. Mayer and Meltzer for the great interest they have shown in the instrument and the pains they have taken to produce a really workmanlike tool.

The main points of the instrument may be summarised as follows:

(1) It consists of three separate parts instead of, as in most other patterns, six.

(2) There are no screws in it; the handle and turn-button which holds down the spring are permanently attached to the "bed-plate."

(3) The bed-plate has no grooves at the sides, or slot at the end, so that it can be cleaned perfectly in a few seconds.

(4) The spring and retaining sheath for the blade are in one piece, and, as the grooves are open, this part also can be cleaned in a few seconds.

(5) The handle is of an entirely new shape with a slight forward tilt and a forward curve at its extremity, giving great power of lateral pressure against the pillars of the fauces.¹

(6) The instrument can be taken to pieces and put together again in ten seconds by the watch.

(7) A nurse can thoroughly clean and polish the whole instrument, preparatory to sterilising or putting away, in three minutes.

(8) An extended trial shows that it is thoroughly efficient in its work, the blade being in perfect apposition to the "bed-plate," and held down by exactly the right amount of pressure applied in the right place.

BOOKS RECEIVED.

Handbuch der speciellen Chirurgie des Ohres und der Obren Luftwege.

By *Drs. L. Katz, H. Preysing, and F. Blumenfeld*. With coloured plates. 1 Bd. Liefer: 1 and 3. Würzburg: Curt Kabitsch (A. Stuber's Verlag), 1911.

New and Non-Official Remedies, 1911.—Articles accepted by the Council on Pharmacy and Chemistry of the American Medical Association prior to January 1, 1911. Chicago: Press of the American Medical Association, 1911.

Diseases of the Nose, Throat, and Ear, Medical and Surgical. By *William Lincoln Ballenger, M.D.*, Professor of Otology, etc., University of Illinois, etc. Third edition, revised and enlarged. Illustrated with 506 engravings and 22 plates. London: Henry Kimpton. Glasgow: Alexander Stenhouse, 1911.

¹ This handle has not been approved by all the users of the instrument, and trials are being made with other handles in order to discover the perfect universal handle.

THE JOURNAL OF LARYNGOLOGY, RHINOLOGY AND OTOTOLOGY.

Original Articles are accepted by the Editors of this Journal on the condition that they have not previously been published elsewhere.

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THE SEMON LECTURESHIP IN LARYNGOLOGY.

ALL laryngologists, both at home and abroad, will receive with warm gratification the intimation that the funds collected for the purpose of presenting a testimonial to Sir Felix Semon, on the occasion of his retirement from active practice, have been handed over to the University of London in order to found a Lectureship in Laryngology. According to the conditions attached to the foundation the lecturer will be appointed annually, and for one year only, and will be selected from among those persons who may be deemed to have advanced in their time the science and practice of laryngology or rhinology, particularly in relation to general medicine, whether by scientific investigation, clinical research, or by means of work devoted to the history of the specialities. The Trust is primarily intended to encourage work of this kind amongst the laryngologists and rhinologists of Britain; but foreign laryngologists and rhinologists, and medical men, British or foreign, who do not habitually confine their practice solely to laryngology and rhinology, will be eligible for the post. The lecture, or lectures, to be delivered annually, must deal with some aspect of laryngology or rhinology, but these terms are defined by the Trust deed so as to include the medicine and surgery not only of the nasal, pharyngeal, and laryngeal regions, but also of the trachea, the bronchial tree, and the œsophagus.

On behalf of the general body of British laryngologists and

rhinologists we have much pleasure in expressing our deep sense of indebtedness to Sir Felix Semon for this further token of a life-long aspiration to elevate to a position of the highest dignity the speciality of which he himself is so distinguished an ornament. As is well known, laryngology owes to him not only many of its most striking scientific advances, but also many a victory won over adverse and reactionary forces which, in the earlier stages of its career, threatened it with a secondary place in the ranks of medical specialities.

As an indication that these days of difficulty and conflict are passing away, no less than for its encouragement to British science, we hail with pleasure the foundation of the Semon Lectureship.

In conclusion, we may be permitted to express the hope that the veteran founder may long be spared to welcome many representative laryngologists to the lectureship, and that the distinction of each successive lecturer may ever increasingly add lustre and renown both to the University of London and to British Laryngology.

OCULAR SYMPTOMS PRODUCED BY NASAL DISEASE.¹

BY H. H. B. CUNNINGHAM, M.D., F.R.C.S.I., M.R.C.S.ENG.,

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Belfast Ophthalmic Hospital; Extern Examiner in Ophthalmology and
Otology, National University of Ireland; Examiner in
Ophthalmology and Otology, Royal College of
Surgeons in Ireland.

IN recent years attention has been drawn to the frequency with which various ocular signs and symptoms are directly and indirectly engendered by disease of the nose itself or in one or other of its accessory sinuses. Moritz,² writing on this subject, stated that the eye symptoms most frequently connected with nasal disease are—(1) Obstruction of the nasal duct; (2) conjunctivitis; (3) inflammatory œdema of the eyelids.

A considerable amount of work has been done on this subject, in connection with which the names of Onodi, Logan Turner, Birch-Hirschfeld, St'clair Thompson, Axenfeld, and Fish, at once occur to one, and the patient researches of Onodi³ may fairly entitle them to be placed in that category yeblept classical work.

¹ An address read before the Biological Club, Dublin, on January 31, 1911.

² Siegmund Moritz, *Brit. Med. Journ.*, January 28, 1905.

³ "The Optic Nerve and Accessory Sinuses of the Nose," A. Onodi, 1910.

With the tendency of the present day for specialism to confine itself more and more to the study of one particular organ, *exempli gratia* the eye, it is apt to overlook for the moment an ætiological factor, not immediately apparent, that has set up serious mischief in the organ under consideration, and which all this time is lurking unknown and unseen in the hidden recesses of some neighbouring tissue.

To explain the relation of ocular symptoms to nasal disease it will be necessary for me to remind you of the propinquity of the nasal accessory sinus to the optic foramen and orbit, and of the very delicate structures forming the barriers between them.

As regards the relation of the optic nerve to the accessory sinus, Onodi has shown :

(1) A thick layer of bone may exist between the optic nerve and sulcus, so that neither the sphenoidal sinus nor the ethmoidal cells are in relation to the nerve.

(2) The ethmoidal cells may be in relation to the optic nerve, and, indeed, almost completely surround it; at the same time the sphenoidal sinus is not in relation to this nerve.

(3) The optic nerve and chiasma may be in relation to the homolateral sphenoidal sinus and also to the contra-lateral.

(4) Both posterior ethmoidal cell and sphenoidal sinus of the same side may be in relation to the homolateral optic nerve.

(5) On one side the sphenoidal sinus may be in relation to its homo-lateral optic nerve, whilst in the same case the contra-lateral nerve may be in relation to the posterior ethmoidal cell on its side.

It is also necessary to bear in mind the very large number, and extent of their relations to each other, and great variety in size, of the frontal, antral, and sphenoidal sinuses and ethmoidal cells.

The maladies about to be described may be classified thus :

(1) Ocular signs produced by disease of the nasal mucous membrane.

(2) Ocular signs and symptoms produced by disease of the nasal accessory sinus.

(3) Ocular symptoms produced by disease of the nasal accessory sinus.

OCULAR SIGNS PRODUCED BY DISEASE OF THE NASAL MUCCOUS MEMBRANE.

Epiphora, a fairly common complaint, is distressing to the patient, and even liable to give rise to mental anxiety. The

sufferers may complain of epiphora alone, sometimes of a slight conjunctivitis in addition, these signs frequently being of some considerable duration, for which advice is eventually sought; subsequently the following tale is occasionally unfolded:

First, the treatment consists of a simple eye lotion, but with no effect; then the duct is syringed, perhaps a canaliculotomy performed, possibly a probe passed. The duct now being found somewhat stenosed, a happy arrangement is then inaugurated, viz.: Lavage of the duct by syringing it at regular intervals; this is, indeed, happy, being a profitable experience both to patient and to practitioner. Unfortunately time passes, but the anticipated recovery does not take place, so that another practitioner is consulted, who, having informed himself of the previous treatment, and being therefore so much the wiser, naturally carries the investigation further, when, in the words of Burton, "as clear and as manifest as the nose in a man's face." The nasal trouble is revealed in the form, perhaps, of hyperplasia of the inferior turbinal, or of vasomotor or hypertrophic rhinitis, occluding the nasal orifice of the lacrimal duct, or in the presence of atrophic rhinitis, which by contraction of the mucous membrane effectively occludes the duct.

The value of a thorough investigation is well shown by the following cases:

S. A.—, aged seventy-three, sought advice for continual epiphora of long duration. An attempt to syringe through the nasal duct disclosed the fact that it was occluded. On conducting a rhinological examination, marked hypertrophic rhinitis with considerable swelling of the turbinals was evident. In addition a small quantity of mucus-pus and some polypi were found in the right middle meatus.

The nasal condition received appropriate treatment, with the result that a considerable lessening of the epiphora was reported a month later.

R. B.—, aged fifty-four, giving a history of epiphora of four or five years' duration, sought advice for an acute dacryocystitis, the onset of which took place four days previously. The abscess was evacuated, fomentations applied, and then the stenosed nasal duct treated by syringing at regular intervals for a little over three months. During this period the epiphora became much less in amount, but did not cease. The patient was then seized with a bad attack of coryza, and four days later complained of obnubilation, a greenish-coloured mist apparently pervading the space before the right eye; also that the right side of the field of vision of the right eye was defective—in other words, that she was unable to see objects in this area. It was noted at this date that vision, right and left eye, $\frac{6}{60}$; tension each eye, normal; no pain in either eye. Right pupil reacted to light, but not actively; left pupil reacted to light actively. Ophthalmoscopy showed a slight haziness to the inner side of the right disc.

Three days later a rhinological examination was carried out, when advanced atrophic rhinitis was found, the whole nasal mucous membrane being considerably

atrophied and covered with dirty grey coloured crusts, as also was the mucous membrane of the naso-pharynx. The ethmoid and turbinals had undergone absorption to such an extent that both ostia sphenoidales were plainly visible. The nose now received attention, with the result that the epiphora so decreased in amount as to cease to cause any trouble, and she no longer complained of hemianopsia.

E. S —, aged forty-five, sought advice for epiphora and swellings at both inner canthi, and gave a history of two years' duration of the complaint; pressure exerted over the lacrimal sacs had the effect of extruding muco-pus into the interpalpebral apertures. The treatment adopted consisted in the first instance of lavage, probing and syringing the ducts. However, on a rhinological examination being carried out extensive atrophic rhinitis was revealed, both nares being full of malodorous crusts together with some pus, and a considerable amount of destruction and absorption of each side of the ethmoid and of the whole of the turbinal structures had taken place.

Meyer,¹ in an examination of eighty-eight cases of lacrimal disease, in the majority of which epiphora was the sole symptom, found a normal nose to be present in only seven instances.

In other cases, especially amongst children, a form of chronic catarrhal conjunctivitis exists which is resistant to treatment, and often continues for a somewhat lengthy period; concurrent with the eye symptoms will frequently be found a muco-purulent, or even purulent rhinorrhœa, the conjunctivitis in these cases being the result of continued infection by continuity of tissue, *via* the lacrimal duct. Effective treatment of the deranged nasal mucous membrane will materially assist in enabling the conjunctiva to resume its normal healthy state.

The writer has previously recorded an instance of this.² A child, aged three, was brought for advice, exhibiting the usual signs of catarrhal conjunctivitis, and giving a history of three weeks' duration. He was also suffering from rhinorrhœa and double otorrhœa. Attention was directed to this in addition to the eyes, so that three weeks later, when both the rhinorrhœa and otorrhœa had ceased, he could open his eyes slightly; a fortnight later the photophobia had disappeared, and he was almost well.

When mentioning rhinorrhœa in the young, one must bear in mind that this frequently is a sign of a pathological condition of the pharyngeal tonsil—in other words, of the presence of adenoids.

At the annual meeting of the British Medical Association, 1909, Dr. William Killen reiterated and amplified an observation made by Maxwell in 1898, that symptoms of asthenopia occurring in children and young adults which were not relieved by the wearing of glasses could frequently be cured by the removal of adenoids.

It is advisable to make a careful examination of any case

¹ *Zeitsch. f. Augenheilk.*, February, 1909.

² "Some Types of Conjunctivitis," H. H. B. Cunningham, *Brit. Med. Journ.*, November 23, 1907.

presenting such reflex neuroses as asthenopia, for they have repeatedly been traced to a nasal origin.

Ziegler,¹ writing on reflex neuroses, described the most frequent causes of nasal asthenopia as:

(1) Pressure contact (usually of the middle turbinal against surrounding structures).

(2) Hyperæsthesia.

(3) Nasal obstruction.

Pegler² relates a case of ocular fatigue and headaches due to asthenopia, which was not benefited by the wearing of glasses prescribed for a slight error of refraction, nor by a period of rest of four months' duration, but in which after the performance of a right anterior inferior tubinectomy the symptoms of eye-strain immediately vanished, and the headaches became rarer, and finally disappeared too.

OCULAR SIGNS AND SYMPTOMS PRODUCED BY DISEASE OF THE NASAL ACCESSORY SINUS.

Birch-Hirschfeld,³ on examining the records of 684 cases of orbital inflammation, found that no less than 409 were due to accessory sinus inflammation.

Disease, situated in any of the accessory sinuses of the nose, can be divided into two groups: (*a*) acute; (*b*) chronic.

Acute sinusitis, as a general rule, is a disease of short duration with definite febrile symptoms; on the other hand, chronic sinusitis, a chronic catarrhal purulent inflammation, affecting the mucous membrane lining the sinus in question, with more or less occlusion of its ostium, so that the sinus becomes filled with pus, may exist for some considerable time without the victim being aware of its existence. It is this disease which is the origin of many ocular affections. According to Logan Turner⁴ the anterior group of sinuses may be responsible for bulbar affections, whilst those of the posterior group for retro-bulbar affections.

Various pyogenic micro-organisms are concerned in the production of this pus, such as streptococci, staphylococci, pneumococci, and others, of which the streptococcus is the most important, the presence of this micro-organism usually necessitating a grave prognosis.

¹ S. L. Ziegler, *New York Med. Journ.*, November, 1908.

² H. Pegler, *Brit. Med. Journ.*, November 26, 1910.

³ *Klin. Monatsbl. f. Augenheilk.*, January, 1908.

⁴ *Brit. Med. Journ.*, September 12, 1905.

The very thin layer of osseous tissue which may exist between a diseased sinus and its neighbouring ocular structures having already been shown, it is now necessary to trace the path of infection.

Disease may spread from the unhealthy to the healthy tissue through this plate of bone in three ways:

- (1) Directly through the bone.
- (2) Circuminsously by means of the blood-stream.
- (3) Indirectly by means of the lymph-circulation.

(1) *Through the Bone.*

Ortmann¹ has shown in a fatal case of cavernous sinus thrombosis and extra-dural abscess that the meninges were infected directly through the bone by means of periostitis and purulent osteo-myelitis, having found the same diplococci in the sphenoidal mucous membrane, periosteum, and body of the sphenoid bone.

(2) *Through the Blood-stream.*

There exists a very free anastomosis between the veins of the nose and those of the surrounding structures.

The anterior ethmoidal veins with those of the dura and pia mater. The veins of the nasal mucous membrane with those of the palate, pharynx, and with the pterygo-palatine plexus.

The venous plexus surrounding the lacrimal duct opens into the anterior facial vein, and communicates with the ophthalmic and infra-orbital veins.

The superior ophthalmic vein communicates with the ethmoidal veins, with the central vein of the retina and with the inferior ophthalmic vein.

Infection spreads by thrombosis, embolism, or thrombophlebitis. Hajek,² in a fatal case of purulent meningitis, found the *Streptococcus pyogenes* in the intra-cranial exudate, blood-vessels, and in the mucous membrane lining the ethmoidal cells on the left side, and the maxillary antra, both of which were in a state of inflammatory œdema.

(3) *Through the Lymph Circulation.*

It is extremely probable that the lymph circulation provides a path of infection; indeed, this is usually stated to be so. In a case

¹ Virchow's *Archives*, Bd. cxx.

² *Archiv f. Laryngologie*, Bd. xviii.

of suppurative meningitis due to sphenoidal sinusitis, Zorkendorfer¹ concluded that the transmission of the disease took place *viâ* the lymphatics, as he found the same micro-organism in the meningeal as in the sphenoidal pus, but not in the blood, nor in the substance of the brain. However, so far as I am aware, in no case has it yet been definitely proved by *post-mortem* examination that the path of infection lay in this channel.

Many and diverse ocular signs and symptoms have been described by different observers; of these the most important are tabulated thus:

Frontal sinusitis: Periostitis and orbital cellulitis, exophthalmos, diplopia, hyperæmia of the optic disc, haziness of the vitreous.

Maxillary sinusitis: Blepharospasm, lacrimation, purulent dacryocystitis, œdema of the retro-bulbar tissue, exophthalmos, hyperæmia of the optic disc, visual disturbance, transient amblyopia, amaurosis.

Ethmoiditis: Mucocœle, purulent dacryocystitis, diplopia, exophthalmos, amaurosis.

Sphenoidal sinusitis: Paralysis of the third nerve, of the sixth nerve, and of the second division of the fifth nerve; papillitis, retrobulbar neuritis, optic atrophy.

Mackey,² however, classifies the diseases in four groups, viz.:

(1) Mucocœles.

(2) Sinusitis, accompanied by external ocular signs, *e. g.* orbital cellulitis.

(3) Sinusitis without external signs, but with:—

(a) Ophthalmoscopic signs, *e. g.* optic neuritis.

(b) Without ophthalmoscopic signs, but with disturbances of vision, *e. g.* central scotoma.

(4) Ocular affections in which the nasal connection is not clearly established, *e. g.* affections of the cornea or iris.

The explanation of amblyopia and amaurosis is to be sought in the anatomical surroundings of the optic nerve, whilst in the optic foramen, where pressure may be exerted on the nerve by distension of the veins surrounding it, or as suggested by the writer³ in 1907, by sympathetic œdema into the nerve and nerve-sheath.

Visual disturbance, due to nasal disease, is frequently unilateral,

¹ *Prager med. Woch.*, xviii.

² *Brit. Med. Journ.*, September 12, 1908.

³ *Zeitschr. f. Augenheilk.*, Bd. xvii, II. 4.

and though it is usual for the homolateral nerve to be affected, occasionally it is the contra-lateral alone.

The literature now contains abundant evidence of the nasal origin of ocular affections. Fish,¹ in an interesting study of thirty-six consecutive cases of optic neuritis, showed the presence of nasal accessory sinus disease in twenty-six, and the great improvement of impaired vision that resulted from surgical attention to the nasal disease in many of the cases. These cases, when seen early, usually admit of successful treatment, as evidenced by a case published by the writer in the *Zeitschrift für Augenheilkunde*, Bd. xvii, 1907, in which a patient complaining of diplopia, vertigo, left-sided headaches and left fœtid rhinorrhœa, and also showing slight left proptosis, slight contraction of the left field of vision and pus in the region of the left ostium sphenoidale, was relieved of his symptoms by lavage of the sinus by means of a sinus catheter. A further instance of the beneficial result of timely interference is recorded by Knapp,² in which a female, aged thirty, who had become completely blind in the left eye a fortnight previously, showed left optic neuritis with swelling of the disc to the extent of 2.5 D. Removal of the anterior half of the left middle turbinate, which was swollen and "soggy," was speedily followed by improvement in vision, and as a month later the right eye commenced to fail, the right middle turbinal received similar treatment, the final result being recovery of full vision. On the other hand, when the treatment is delayed unhappy results are to be expected, as evidenced by the following case:

T. H.—, aged forty-one, stated that four years previously his sight commenced to gradually fail, the right eye being the first affected, but the left becoming blind prior to the right, a period of about seven months elapsing between the onset and supervention of blindness. He was unaware of any defect in the nose till this was pointed out and the right ostium sphenoidale enlarged by Fish, but unfortunately without benefit. When seen by the writer, though quite blind, he complained of a light being always present, which was a constant source of trouble; however, this disappeared after the left ostium sphenoidale had been opened up and the sinus irrigated a few times. This result is interesting, and in explanation one ventures to suggest that it was the effect of continual centripetal stimuli derived from a diseased sphenoidal sinus acting on that portion of the optic nerve in juxtaposition to the sinus, and passing through this structure and the optic tract to the visual area of the cortex cerebri.

Unfortunately many such cases of undetected sphenoidal sinusitis occur resulting in irremediable amaurosis.

¹ *Brit. Med. Journ.*, November 2, 1907.

² *Trans. Amer. Ophth. Soc.*, vol. xi, pt. 3, 1908.

Chemosis, papillædema, proptosis, paralysis of the ocular muscles, and redness of the eyelids form, *inter alia*, the important ocular signs of that very grave disease, cavernous sinus thrombosis, often a result of suppuration in the sphenoidal sinus or in the posterior ethmoidal cell.

In an exhaustive contribution to this subject StClair Thomson¹ has drawn attention to the fact that in many autopsies showing intra-cranial suppuration, in which the focus of the disease was not discovered, had the sphenoidal sinus been examined the origin of the disease would have been revealed.

Jackson,² as the result of a study of 209 cases, gives a lucid description of the ocular signs of this disease, in which the most important, such as exophthalmos, "choking" of the disc, are produced by venous stasis.

Bartels,³ on the other hand, in an interesting paper, states that complete obstruction of blood-flow in both cavernous sinuses need not give rise to a choked disc.

S. Stephenson⁴ has recorded three cases of malignant disease of the accessory sinus, in which failure of vision, proptosis, and restricted movements of the affected eye were amongst the earliest signs.

OCULAR SYMPTOMS PRODUCED BY DISEASE OF THE NASAL ACCESSORY SINUS.

Occasionally disease in a nasal accessory sinus, whilst giving rise to reflex symptoms, does not exhibit any very definite sign of its existence, so that attention not being directed to the origin of the mischief it is at first apt to be overlooked.

Observation has shown the group of symptoms known as asthenopia to be a result of disease of the ethmoid, maxillary antrum, or sphenoidal sinus, and such reflex neuroses as bulbar and periorbital neuralgias to accompany a frontal sinusitis.

Blepharo-spasm, asthma, and even angina pectoris⁵ have been traced to suppuration in the antrum of Highmore.

Green⁶ states that moderate œdema of the eyelids, most marked in the morning and on bending forward, is often associated with

¹ *Trans. of the Medical Society of London*, vol. xxix.

² *Ophthalmology*, January, 1909.

³ *Zeitschr. f. Augenheilk.*, January, 1909.

⁴ *Ophthalmoscope*, April, 1908.

⁵ "The Optic Nerve and Accessory Sinuses of the Nose," A. Onodi, 1910.

⁶ *Ophth. Record*, June, 1906.

sinus disease; when present it is frequently unilateral, being then homolateral with the sinus.

Boon¹ relates the history of a case in which a "watery eye" had been treated for some considerable time, but unsuccessfully, which, however, became cured spontaneously on the removal of an intra-nasal tumour.

Paunz² has recorded six cases of retro-bulbar neuritis, in five of which colour scotomata were present; operative measures on diseased nasal structures not previously complained of resulted in improvement or complete recovery of vision in five.

Then there are cases of so-called eye-strain, whose symptoms consist mainly of frontal headache with pain of varying intensity around one or both eyes. These sufferers have possibly been treated with nerve depressants and tonics, their alimentary system carefully attended to, and even glasses prescribed, perhaps more than once, but, alas! to no effect, they all this time being victims of a frontal sinusitis.

M. M—, aged twenty-four, sought advice for continual frontal headache of one year's duration, and presented the somewhat drawn, heavy-eyed appearance often showed by those suffering from continual pain in the region of the orbit. On careful examination a slightly raised, somewhat curvilinear swelling was observed over the inner side of the right eyebrow; on percussing this lightly some tenderness was elicited, but not more than that usually complained of when the area of a nerve affected by neuralgia is percussed. In addition, a small quantity of pus was found in the right middle meatus of the nose. The right frontal sinus was opened by removing its outer bony wall, on which the lining mucous membrane immediately bulged forward into the wound; on this being incised pus freely escaped. Free drainage having been provided, the headaches disappeared, and the patient became quite bright and cheerful.

The existence of congenital developmental anomalies, though fortunately rare, must be mentioned, in which blindness has resulted from an overgrowth of the normal osseous tissue in the region of the orbit; this, by contracting the lumen of the optic foramen, has through pressure caused degeneration of its contained structure, and so deprived the optic nerve of its physiological function.

Virchow³ and Manz⁴ have shown by *post-mortem* examinations that this condition may result from contraction of the optic foramen. Onodi mentions two cases of anosmia and amaurosis due to contraction of the olfactory and optic foramina.

In conclusion, perhaps one may be permitted to summarise this

¹ "Ned Tijdschrift voor Geneeskunde," 1906, i.

² *Arch. of Ophthalmology*, January, 1909.

³ "Krankhafte Geschwulste."

⁴ "Heidelberger Berichte," 1887.

short and necessarily sketchy paper as an appeal for the thorough investigation of the condition of the nose and nasal accessory sinns in those cases producing ocular signs and symptoms, the ætiology of which is obscure, and which do not rapidly react to treatment. Indeed, one may well bear in mind the precept contained in those well-known words—

“Defer not till to-morrow to be wise,
To-morrow’s sun to thee may never rise.”

ÆTIOLOGY AND OPERATIVE CURE OF COLLAPSE OF THE ALÆ NASI.¹

BY DR. MAX HALLE (Charlottenburg).

Translated by J. B. HORGAN, M.B., Ch.B.,

Rhinologist and Laryngologist to the North Charitable Infirmary, Cork.

UNDER normal conditions collapse of the alæ nasi may be produced by forced inspiration; this causes considerable rarefaction of the intra-nasal air, which, as it cannot be sufficiently compensated for by the stream of inspiratory air, allows the external atmospheric pressure to predominate and forces the alæ nasi against the septum. Three factors tend to counteract this force: (1) The normal tension of the tissues composing the alæ nasi; (2) the alar cartilage, which lies with a slight internal concavity in the nasal wing, and possesses an appreciable amount of firmness and elasticity. During normal quiet inspiration these forces are sufficient to maintain a patent nasal aperture, and to guarantee free nasal respiration. Matters are, however, different when, as will shortly be considered, pathological changes are present. In such cases the nasal wings will be compressed even during quiet inspiration, the resulting respiratory disturbances being, according to Schmidthuisen, sometimes so intense that the patient is obliged to open the nasal aperture with his hand.

Considerable embarrassment may, however, be produced by a partial alar collapse. It need only be mentioned that this condition of the alæ nasi is a hindrance to a quick and effective performance of the respiratory function, and that, to compensate for this, mouth-breathing has to be adopted. There is produced a small but persistent negative pressure in the nose, and this, as

¹ The original article appeared in the *Archiv f. Laryngologie* of April, 1910.

previously pointed out by Moritz Schmidt, eventually leads to chronic hyperaemia and secondary hypertrophy of the nasal mucous membrane.

The subjective symptoms vary considerably in different cases, even under similar pathological conditions. Many people afflicted with this form of obstruction suffer considerably, whilst others seldom or never complain. We cannot be altogether surprised at this, seeing that many people never become aware of even pronounced nasal obstruction, because they have accustomed themselves to the condition from childhood, and have never learnt the normal relation of the nose to the respiratory act. Such patients only seek medical advice on account of secondary affections of the larynx, pharynx, bronchi, ear, etc.

Text-books, as a rule, refer only very briefly to the pathological conditions resulting from collapse of the alae nasi. This subject has been almost entirely neglected by Stoerk, Mackenzie, Secheh, and others. Moritz Schmidt states that "collapse of the alae nasi is met with in individuals who have been breathing either incompletely or not at all through the nose for a prolonged period. In this manner there is produced an atrophy of the levatores alarum nasi, which do not at a later date regain their function if the nasal obstruction be overcome. It is also not infrequently observed in those who are seriously ill or dying, and adds considerably to their embarrassment." The condition is likewise briefly referred to by Gaule in Heymann's text-book. The therapy of alar collapse is extensively dealt with by Onodi and Rosenberg, though they say little or nothing of its aetiology.

For some years past I have devoted increased attention to this condition, partly because of some difficult cases that I have met with, and partly because it appears to me to be a condition which merits closer attention. By careful observation I have learned that the collapse may be caused by any of those parts which enter into the formation of the nasal vestibule, that is to say either by the alae nasi or by the cartilaginous or membranous septum. In some cases the floor of the nose and the anterior inferior nasal spine are at fault, whilst in others the aetiological factor may be supplied by an anomalous position of the triangular cartilage.

In the alae nasi the chief factors to be considered in the production of collapse are atrophy of the levator muscles, slackness of the subcutaneous tissues and the alar cartilages, or too pronounced a curvature of the latter from above downwards. Though the first two factors have been often observed I have been unable to find a

single instance where the excessive curvature of the cartilage has been taken into account. In this condition—which may often be appreciated by external examination owing to the deep groove present above the *alæ nasi*—the upper border of the cartilage projects markedly into the nasal vestibule and may often cause the alar and septal mucous membranes to lie in contact. In this region it is frequent to find a serous or muco-purulent secretion which may be responsible for attacks of sneezing or a “running” from the nose. In such cases it is of the utmost importance that the examination of the nose should in the first instance be conducted without a speculum, or if such be used the branches of the instrument should be opened as little as possible, otherwise the existing relations of the parts will naturally be quite altered. If, now, the upper border of the alar cartilage be found to lie in opposition with the septum, a collapse of the *alæ nasi* may often be produced by simply getting the patient to inspire through the nose. Sometimes in a small nose this condition may be brought about by abnormal curvature of the triangular cartilage, the inferior border of the latter projecting sharply below. In these cases, also, secretion—either serous or purulent—may be seen between the approximating surfaces.

Though it is commonly recognised that subluxations and deviations of the cartilaginous septum are frequent causes of collapse, the anomalies of the membranous septum are seldom considered in this respect. Under normal conditions the latter forms a tense fold of skin which stretches in a straight line from the point to the floor of the nose. In its posterior inferior part it frequently broadens out so as to assume an almost conical shape. With regard to the latter there occur very considerable variations. This conical thickening sometimes starts immediately behind the point of the nose, and attains such dimensions that it causes an appreciable diminution in the width of the nasal vestibule on both sides. This thickening is rarely due to hyperplasia of the subcutaneous or submucous tissues. More frequently it is caused by a broadening and anterior superior projection of the antero-inferior nasal spine. In other cases it is due to an abnormal position of the short or septal crus of the alar cartilage, which normally curves round in the membranous septum and runs in a sagittal plane. Should this spur happen to have a marked lateral projection, it forms together with the subcutaneous tissues (which in such cases are usually in excess) a considerable thickening of the membranous septum, and in this manner causes so marked a

diminution in the calibre of the nasal vestibule that the distance between the alæ nasi and the thickened cartilage may not exceed 1-2 millimetres.

Alar collapse is more rarely due to exostoses which spring from the floor of the nasal aperture.

This affection has up to the present been most often treated by getting the patient to wear some sort of support. Of such the nasal dilators of Feldbausch and Schmidhuisen have proved themselves most generally useful. Guye uses small pieces of drainage-tube, while Jankau recommends an olive-shaped support made of vulcanite, with openings at each end. Kafemann uses as an obdurator an oval conical metal tube which is provided with an arrangement to regulate the air-current.

None of these apparatus are efficient in removing the disturbance, and though they serve more or less as an orthopædic help, they are unable to ensure the normal play of the nasal wings, whereby the inspiratory air is regulated at the nasal aperture during the respiratory act. The nasal wings are converted into a tense covering for the obdurator. The supports of Feldbausch are the only ones which leave the alæ nasi tolerably free to act; they are, however, visible externally, and patients refuse to wear them except in very severe cases. Heermann sought to overcome the difficulty occasioned by the want of a suitable apparatus by dilating the navicular fossa at the anterior part of the vestibule with a conical piece of wool soaked in vaselin. But none of these methods render adequate aid, and should only be employed when the patient is ready to endure any amount of annoyance rather than subject himself to the most insignificant operative interference. In my opinion, however, it is the surgeon's duty to permanently rid the patient of his trouble, and I believe that this is never a difficult matter.

When examining the nose it is of primary importance to determine which of the structures surrounding the aperture is responsible for the alar collapse. Deficient action of the levator muscles can only be remedied when the nasal aperture is free and the muscle can be functionally exercised; it therefore is only of secondary consideration. When the obstruction is caused by excessive curvature of the alar cartilage, so that the upper border of the latter approximates the cartilaginous septum, I operate as follows: Having carefully incised the alar mucous membrane down to the cartilage by an incision running slightly below the approximating edge, and having then carefully dissected the

membrane and perichondrium from the edge, I remove so much of the upper edge of the alar cartilage that the upper part of the latter comes to lie at a sufficient distance from the septum. The mucous membrane may either be stitched up or opposed by means of a tamponade. If the piece of cartilage removed is unusually large, it may be advisable to remove a slender strip of mucous membrane in order to avoid a subsequent redundancy. In a similar manner I have removed the inferior edge of the alar cartilage if it happened to be in apposition with the septum. In the description of this little operation it is to be noted that the incision is not made in the free border of the cartilage, but a little bit removed from the latter, since the cartilaginous border is always firmly embedded in the mucous membrane. By working from below upwards the separation of the structures is almost as easy as separating the mucoperichondrium from the quadrangular cartilage when performing the subperichondrial resection of the latter.

In cases where the alar cartilage is very delicate and yielding it is unable to offer sufficient resistance to the atmospheric pressure. In order to increase the resistance of the *alae nasi* Menzel advises the injection of paraffin into the nasal wings. Such a proceeding does not appear to me to be justifiable, because the parts in question are so thin and delicate that even the smallest quantity of paraffin more than is absolutely necessary would cause a bad result cosmetically, and a paraffin syringe may sometimes prove a very unreliable instrument even in experienced hands. Eckstein, on cosmetic grounds, has proposed an operative method for dealing with retracted scars of the *alae nasi*. He makes a small incision at the lower part of the *sulcus alaris*. From this he passes a fine silver wire along the free edge of the nasal wing, passing underneath the retraction and emerging near the tip of the nose. The suture is then re-introduced at its joint of exit and carried in a direction upwards and outwards in proximity with the upper border of the lateral cartilage, and, as the case may be, beneath the retraction; the wire is now re-introduced at its second point of exit and carried subcutaneously to its original point of introduction, where the two ends of the suture are twisted, cut short, and buried. The original wound is now stitched up. In this manner a triangular suture of silver wire is buried in the tissues, and I have been able to satisfy myself that it serves its purpose well. There is scarcely any external scar left after this operation. To attain the same object, however, it appears to me to be more practical to make an incision on the internal surface of the nasal wing, and from this.

working with a fine scalpel, to form a small pocket on the lateral aspect of the alar cartilage. In this pocket it is possible to place a fine silver support shaped somewhat like the band of a watch. This support, which should have a slight outward convexity in conformity with the shape of the nasal wing, had best be specially prepared for each case. The primary incision is finally sutured.

If the alar collapse is due to subluxation or deviation of the septal cartilage the latter should be resected by one of the methods now generally adopted. It is also possible by working from the anterior nasal aperture to remove exostoses of this region as well as thickening of the antero-inferior nasal spine. The lower bony margin is freed by an incision made at the junction of the skin and mucous membrane, the mucous membrane and the periosteum reflected, and the disturbing bony projection removed with chisel and bone forceps.

The method of procedure is slightly more difficult when the nasal aperture is obstructed by the thickening of the membranous septum described above. In such cases I proceed as follows: The incision is made at the juncture of the skin and mucous membrane, parallel to the free edge of the membranous septum if the cartilaginous septum is to be resected at the same time, the bow-shaped incision recommended by me, and reaching forwards may be used for the double purpose). The lower part of the membranous septum is now turned outward, and the thickened parts (subcutaneous tissue or cartilage as the case may be) excised and the incision sutured. If the cartilage is also prominent on the other side the same operation may be repeated to a greater or lesser extent on this side. At the conclusion of the operation I pass a suture through the postero-inferior part of the membranous septum, then carry the needle over a piece of violet gauze to the point of the nose piercing the latter, and tying the two ends of the suture over a second piece of gauze on the other side. The purpose of this suture is to prevent the stitches from cutting out, and to keep the two sides of the reduced membranous septum firmly in apposition. The stitches may be removed in from two to four days. The result is always excellent, both cosmetically, and having regard to the object for which the operation is performed.

During the six years that I have devoted my attention to these disturbances I have not been very often compelled to have recourse to the small operative manipulations just described. They have, however, given me surprisingly good results in a number of severe cases. I have never found it necessary to subsequently

recommend the patient to wear a dilator, and in some cases patients who have previously reluctantly worn these appliances have been able to quite dispense with their use. Intra-nasal irritation and increase of the sneezing reflex are often cured by the operations described. I believe that the conformity of the anterior nasal aperture demands considerably more attention on our part, and I warmly recommend in suitable cases the insignificant but often very useful operative methods described above.

SOCIETIES' PROCEEDINGS.

PROCEEDINGS OF THE ROYAL SOCIETY OF MEDICINE—LARYNGOLOGICAL SECTION.

May 5, 1911.

DR. P. WATSON-WILLIAMS, *President, in the Chair.*

CASES ILLUSTRATING THE TREATMENT OF FRONTAL SINUS SUPPURATION.

CASE 1.—SHOWN BY DR. STCLAIR THOMSON.

Mrs. M——. This patient was exhibited before the Section on December 4, 1908, fourteen days after a radical Killian operation on the left frontal sinus.¹ The left antrum was operated on at the same time, and a suppurated ethmoidal region cleared away; the sphenoidal sinus was explored and found healthy. A radiograph was useful by showing that the left frontal sinus crossed the middle line, and that there was an orbito-ethmoidal gallery running outwards behind the bridge. The patient begged to have the operation done on account of persistent headache. She has not been up for inspection until the present occasion.

The case is shown as a sample of an excellent result, both in regard to the cosmetic result and the cure of all symptoms.

CASE 2.—SHOWN BY DR. STCLAIR THOMSON.

Mrs. W——. This patient was operated on some years ago for sup-puration in all the accessory sinuses of the right side. Her head symptoms were at one time so severe that she was first admitted to the Queen Square Hospital.

The case is exhibited to illustrate the complete cure of suppuration, and the relief of all symptoms. But the cosmetic result has been somewhat marred owing to the accidental fracture of the Killian bridge during operation. The opening into the sphenoidal sinus is well seen.

CASE 3. SHOWN BY DR. ST. CLAIR THOMSON.

Mr. M. R. —. This man, aged twenty-two, was exhibited to the Society on March 4, 1910.¹ All four cavities were operated on at one sitting. With the exception of a little crust in the ethmoidal region all suppuration has ceased. The cosmetic result is satisfactory, and the patient is cured of his persistent headaches. These headaches had prevented him from pursuing any occupation.

CASE 4.—SHOWN BY DR. IRWIN MOORE.

The patient was a woman, aged fifty, a hospital nurse, with suppuration of the left frontal sinus, maxillary sinus, and ethmoid cells, on whom a radical Killian operation was performed on March 11. Patient came to the London Throat Hospital complaining of constant headache, with severe pains over left frontal sinus and left side of face for eight years, greatly aggravated since August last, and constant purulent discharge from the left nostril (patient using six handkerchiefs a day), which prevented her from attending to her professional work.

On admittance to hospital she was in bad health and was not a good subject for operation, having had four operations during the past fifteen years.

In December last she had influenza, followed by pneumonia, from which she had only recently recovered.

A skiagram taken before operation was useful in showing opacity of the frontal sinus, but did not disclose the full size of the sinus, which, on operating, was found to be large, extending backwards over roof of orbit, and full of polypoid membrane secreting pus. There was no connection with the right frontal sinus. The ethmoid cells were extensively diseased and were thoroughly removed. The portion of the orbital roof forming the floor of the sinus was freely removed. An intra-nasal operation was performed on the left maxillary sinus, which was found full of fetid pus.

There is now (two months after operation) no discharge from the nose, and the washing from the maxillary sinus is practically clear. With the exception of some oedema of the eyelids the patient made an uninterrupted recovery. The headaches have disappeared, and the patient is feeling very much better, and her general health has greatly improved. There is practically no disfigurement.

CASE 5.—SHOWN BY DR. IRWIN MOORE.

The patient was a male, aged eighteen, with suppuration of both frontal sinuses, both maxillary sinuses, and both ethmoids, complicated by external fistula. A previous operation of one sinus had been performed by another surgeon; all four sinuses and both ethmoids were recently operated on by the exhibitor. Three years ago polypi were removed from the right nostril, followed two and a half years later (*i.e.* March, 1910)—by swelling of left eyelid and a frontal abscess. The left frontal sinus was then opened by a median forehead incision, combined with an incision through eyebrow, and a portion of the anterior wall removed.

Condition on admittance to hospital, July, 1910: Complained of severe headache, difficulty of breathing through right nostril, purulent

¹ JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY, vol. XXV, p. 308.

discharge from both nostrils, and discharge from forehead since previous operation. Right nares crowded with polypi and abundance of pus present. Left nares: Polypoid condition of ethmoid, and pus seen in fronto-ethmoid region. Both maxillary sinuses contained fetid pus. There were three discharging sinuses present on left forehead: (1) Centre of upper eyelid, through which a probe could be passed into frontal sinus; (2) above supra-orbital arch, through which a probe passed into frontal sinus; (3) centre of median incision, through which a probe also passed into frontal sinus, and through which fluid could be syringed into left nares.

Operation (September, 1910): The left frontal sinus was opened up through the old incisions and found full of degenerated membrane and pus, which on cultivation showed a nearly pure streptococcus. The anterior wall was freely removed and a large fronto-ethmoid cell discovered and opened up. The left frontal sinus was found to communicate with the right, which was full of pus, and its anterior wall removed. Both ethmoids were cleared away with Luc's forceps (intra-nasally). An intra-nasal operation was then performed on both maxillary sinuses. On account of the unhealthy appearance of the frontal sinuses the wound was not closed.

Patient made a good recovery, and was discharged from hospital in November in much better health. All headache has disappeared. A Caldwell-Luc operation has recently been done on left maxillary-sinus which continued to secrete pus. It was found full of polypi and has now practically cleared up. There is still some pus seen in both fronto-ethmoid regions, also exuding from the median forehead incision, evidently coming from the right frontal sinus. The left frontal sinus appears to be cured, and the fistulae have disappeared. The patient is considerably disfigured by the forehead scar, which is deeply puckered.

This case affords the opportunity of comparing the older Ogston-Luc operation for the more recent and complete Killian operation, as shown in Case 1.

It is proposed to re-operate on the right frontal sinus, and do a plastic operation on forehead.

CASES 6 AND 7.—SHOWN BY MR. STUART-LOW.

These two cases, both in females, aged twenty-five and twenty-eight respectively, were shown to illustrate successful Ogston-Luc operations. In both instances there had been fetid discharge from the nose with severe headaches for years. On inspecting the upper regions of the nasal cavities septic ethmoiditis was found, more marked on the left side in each case. The anterior two thirds of the ethmoid was first removed. The Ogston-Luc operation was then performed, the partition between the two frontal sinuses broken down, and polypi cleared out of both sinuses from the one opening on the left side. The two sinuses were then drained through one rubber drainage-tube passed into the left nasal cavity. The shield used to protect the wound from bandage pressure was also shown.

The result was very good in both cases, the headaches and discharge having ceased, and even now, after the three years, there was no recurrence of the symptoms.

DISCUSSION ON THE PRESENT POSITION OF THE TREATMENT OF
PURULENT DISCHARGE FROM THE FRONTAL SINUSES.

INTRODUCED BY P. WATSON-WILLIAMS, M.D.

(Abstract.)

The subject for discussion falls under two main headings:

- (1) The treatment of acute cases of frontal sinusitis.
- (2) The treatment of chronic cases of frontal sinusitis.

Acute Frontal Sinusitis.—The vast majority of acute cases recover spontaneously. Here, as a rule, our object is to relieve the acute pain and to expedite the discharge of pent-up secretions. Rest in bed, or at least in a warm room, the repeated applications of hot fomentations over the affected sinus, and the exhibition of diaphoretics with purgation are helpful. What may we recommend in the way of intra-nasal treatment? Applications of cocaine in the region of the fronto-nasal duct suffices to enable the purulent contents of the sinus to find an exit through the duct narrowed by the swollen mucosa, and thus relieve the tension which is attended with intolerable pain. In some cases menthol inhalation causes a free flow of watery mucus, and gives relief. I must draw attention to Brünings' *Lichtkopfbad*, which is also commended from experience in his own practice by Von Eicken.¹ It consists of a box with a hole in the anterior wall, through which the head of the recumbent patient passes. There is a tube passing through the wall of the box, with a mouthpiece inside, so that the patient breathes the air from the outside. The box contains four electric lamps, which can be turned on one after the other, when the patient is lying with his head in the box, a cloth surrounding the neck, so as to keep the heated air in the box from escaping. When the lamps are lit, leather goggles are worn to protect the eyes from the great light and heat. When the lamps are turned on the temperature of the air within the box rapidly rises to 59° C., and then upwards to 80° C. or 90° C. The skin of the head and neck soon perspires freely, and the nasal mucosa becomes less swollen, so that the previously blocked passages become pervious; the pain diminishes, and often the affected sinus discharges its purulent contents. The lamps are kept burning for about twenty to thirty minutes, and after they are turned out the box is kept *in situ* for about a further fifteen minutes before the patient's head is uncovered.

In certain cases we are constrained to resort to operative measures, viz.:

(1) When palliative measures are unsuccessful in affording relief, especially if well-marked acute ethmoiditis co-exists. In such cases anterior middle turbinectomy, with removal of the bulla ethmoidalis and opening the lower anterior ethmoid cells, may suffice to remove the obstruction of the fronto-nasal duct.

(2) When there is concomitant cellulitis of the soft tissues externally external operations are generally called for, but should consist in opening the sinus, and lavage, the mucosa being preserved not only of the sinus itself but also of the fronto-nasal duct; only exceptionally is a radical operation needed.

If external operation on the frontal sinus in the acute stage is

¹ Von Eicken's results with this bath, and many other suggestions of great value in the treatment of acute and chronic cases, are given in his paper, "Über die Behandlung der Eiterungen der oberen Nasen Nebenhöhlen," *Verh. d. Vers. Deutsch. Naturf. u. Ärzte*, Köln, 1908.

unavoidable, I believe there is a universal consensus of opinion that the mucous membrane should be preserved, that the operation should be restricted to opening the sinus, washing it out, and, intra-nasally, to the removal of the anterior end of the middle turbinal, and opening up the bulla and anterior ethmoidal cells, and so forth.

(3) When caries of the frontal sinus walls has resulted in an external fistula, or when there is reason to fear intra-cranial complications.

Chronic Frontal Sinus Suppuration.—Opinion is divided with regard to the treatment of chronic frontal sinus suppuration.

Intra-nasal treatment by lavage and local applications to the interior of the affected sinus should be carried out systematically, after the removal of any obstruction to the duct, or of co-existing pathological conditions in the middle meatal region, such as polypus.

It is my custom to treat first any other co-existing suppurating sinus, *e.g.* in the corresponding maxillary antrum, or sphenoidal sinus, and above all the most common co-existing suppuration in the anterior ethmoidal cells. I operate on all other involved sinuses, before resorting to an external frontal sinus operation, for when these other sinuses have been freely opened it is easy to keep them washed out, a fact which favours the cure of the frontal sinus disease.

After the free irrigation of the frontal sinus with saline solutions I have found much benefit from weak solutions of iodine or of protargol, 15 per cent., and in the more inveterate cases nitrate of silver, varying in strength—40 gr. to the ounce or more. Another solution for injection after simple saline, or peroxide of hydrogen irrigation, is a solution of menthol, eucalyptol and terebene in colourless oil of paraffin.

I have had a number of permanent cures of frontal sinus suppuration by these relatively simple means, and although I strongly advocate radical external operation in a restricted class of case, I believe implicitly in the complete efficacy of these intra-nasal methods in a considerable percentage, and in their being more desirable methods of treatment to continue, even if not resulting in absolute cure, provided the symptoms are not such as to make more drastic operative treatment really necessary.

Vaccines of autogenous bacillary emulsions are undoubtedly helpful in some cases, but while they may afford a measure of relief, vaccine treatment rarely results in cure.

Intra-nasal operations with a view to enlarging the fronto-nasal passage, and so effecting drainage and cure, are practised and advocated as successful, particularly by Spiess, Halle, and Fletcher Ingals.

I have never done these particular operations myself, and have never seen any patient on whom they have been performed. Writing to me on February 4, 1911, Dr. Fletcher Ingals said: "I may say that my confidence in the operation is greater each time that I perform it, and I feel that everything you may find in the paper that I read at the International Medical Congress, Budapest, is correct."

Fletcher Ingals, having performed his operation on twenty-nine cases, invited special attention to the following statements in that paper:

"It can be done in almost 95 per cent. of all chronic cases and in the majority of acute cases, provided the anterior end of the middle turbinated body has first been removed.

Experience has shown that the canal left by this operation is as large as desirable, and that the drainage is ample and remains so. This was true in all my cases, even in the one that was not materially improved by the internal and external operations.

"I believe this operation as safe as any other that has thus far been described for treatment of suppuration of the frontal sinus.

"This operation will surely establish free drainage even in some cases of empyema, in which it may not be sufficient to effect a cure. In cases that do not greatly improve within a few weeks, the frontal sinus should be opened externally and cleaned out. The enlarged drainage canal resulting from the intra-nasal opening of the sinus would allow free drainage into the nose and would lessen the danger from the external operation.

"Healing is apparently as rapid after this as after any other operation on the frontal sinus. Probably 95 per cent. of all suitable cases will practically recover within from two weeks to six months."

One is tempted to try this method of intra-nasal drainage. There are certain objections which rise up in one's mind, viz. the inherent danger of such methods of opening into a frontal sinus, although the dangers have been greatly diminished by improved technique and the aid of the Röntgen X-ray screen. Further, even if we concede that a free opening into a frontal sinus can be effected without immediate risk to the patient, it may be objected that:

(1) It lays bare and exposes a bony channel to the invasion of virulent organisms, without removing the pyogenic mucous membrane, which remains to perpetuate the flow of pus.

(2) While depending on the maintenance of an enlarged fronto-nasal passage, the mucosa of the fronto-nasal duct is largely destroyed, with consequent tendency to cicatricial stenosis.

(3) It must often prove impossible to effectually open up and remove all the involved fronto-ethmoidal cells, or irregularly developed ethmoidal cells.

In a large proportion of chronic frontal suppurations the fronto-nasal duct becomes abnormally patent from atrophy of the lining mucous membrane; hence these operations, which can only ensure free drainage for the sinus while adding fresh risks, establish a condition which, though often existing in chronic cases, does not after all result in cure.

Too much stress, it appears to me, is laid on obstruction in the fronto-nasal passage as the essential cause of the persistence of frontal sinus suppuration, and more particularly of the recurrent headache associated with it, as though any operative method which removed such obstructions fulfilled all the conditions essential for curing the patient. Undoubtedly obstruction, preventing the escape of muco-purulent secretion, immensely aggravates the pain of frontal sinusitis, but many patients whose fronto-nasal passage is never obstructed suffer from recurrent exacerbations and headaches, just as a chronic bronchitic suffers from grave discomfort and tightness in his chest in the early stages of recurrent attacks, symptoms which are relieved when the bronchitic secretions become "free." We ought, therefore, to rid our minds of the fallacy of attributing chronic frontal suppuration solely to some obstruction which in many cases has long ceased to exist.

Indications for a radical operation are:

(1) The continuance of a purulent secretion, despite intra-nasal and other treatment, sufficient to cause grave inconvenience or markedly impaired health.

(2) Persistence of headache, or of mental depression, or other nervous phenomena due to frontal sinus disease, especially in neurasthenic patients.

(3) Recurrent facial erysipelas, external or orbital cellulitis, caries of

the sinus walls, the formation of a fistulous opening, and any symptoms suggestive of intra-cranial complications secondary to the sinus.

There is no class of case for which it is more difficult to formulate statistics of the results of operative treatment than those of nasal accessory sinus suppuration. It is difficult to compare one case or one method of treatment with another, unless one is in full possession of the conditions from which the patients were suffering, so much do the conditions—atomical, pathological, and bacteriological—differ in different cases.

The question of operative technique is not an essential point in our discussion. What we are considering is, how far active operative interference compares favourably or otherwise with the *laissez faire* attitude. There is a considerable percentage of cases in which the symptoms are so exceedingly acute, that it is imperative to do more than rely on mere palliative measures, and in other cases the patient's means of livelihood may be so seriously interfered with, that it becomes a matter of the gravest importance for him to be restored to such measure of improved health that he can provide for himself and his family—even though one may not be able to obtain the ideal condition of affairs, or complete cure.

Turning now to the question of radical operations, the details of operative technique are hardly within the scope of our discussion, but we are concerned with types of operations; for instance, if a patient has a small or shallow sinus, we need not hesitate to obliterate it by the operations in class 4, which also have advantages in men of the working class, for whom greater likelihood of cure outweigh the greater liability to deforming scars.

A radical operation on the frontal sinus connotes an operation which aims at the obliteration of the sinus.

As types of the methods advocated with this object we may cite:

(1) The Ogston-Luc operations.

(2) Killian's bridge operation, the operation which is most widely known and practised.

(3) Watson-Williams's osteoplastic operation.

(4) Delsaux's, Riedel's and Kuhnt's operations, involving the total removal of the anterior wall and the floor of the sinus.

If a maxillary antral empyema or purulent discharge from the posterior ethmoidal cells or sphenoidal sinus co-exist, these sinuses should be opened up and treated before resorting to any external operation, unless special circumstances in the case make it unavoidable to delay radical operation, in which case these cavities should be explored, at any rate before the external operation is done, and if containing pus they should be operated on at the same time.

Presuming that a radical operation is necessary, the particular type of operation to adopt must be determined by the nature and conditions of the individual case, and no one operation can be held the best under all circumstances.

Unless the indications for a radical operation are definite, one should rely on minor intra-nasal operative, palliative, and other therapeutic measures.

If a radical operation is advised, one should adopt a method which allows a free access to the whole of the involved territory and the ultimate obliteration of the suppurating cavities with the least cosmetic defect.

A complete cure, with cessation of all purulent discharge, headache and pain, cannot be assured beforehand, and although in suitable and

apparently uncomplicated cases a radical operation will almost certainly afford much relief, the possibility of a fatal result from osteo-myelitis is always a factor to be reckoned with; for, although so far I have had no fatal result, there are no certain means of determining what complicating conditions may be encountered before the frontal sinus has been opened and explored.

I may perhaps be permitted to state my views on my own osteoplastic method very briefly. I usually prefer my method to Killian's, because it affords a freer access to the sinus and opens up the duct and the neighbouring fronto-ethmoidal cells to a more complete inspection, and enables one to look right down the nasal passage and attack the middle turbinal plate and the ethmoidal cells from in front instead of from the outer side. Thus one sees more easily where one is going. With Killian's operation, if we leave a broad bridge it obstructs the view to some extent, renders access to the ethmoidal cells more difficult; whereas, if the bridge is narrow, the bone is liable to become absorbed. Twice this has happened to me from recurrence or persistence of suppuration. On the other hand, I prefer Killian's method if a fistula has formed, or the sinus has been opened through the floor, and several of my most successful cases have been operated on after the method of Killian.

Of my last twenty-eight cases submitted to radical operation on the frontal sinuses, eleven were cured (three Killian method, seven Watson-Williams operation, one Killian and Watson-Williams—right and left); thirteen were much improved (four Killian, nine Watson-Williams); two were improved, but were not satisfactory; two were decidedly unsatisfactory in result; both, however, were complicated cases—one had aortic and other valvular heart disease, and was intensely neurotic, and the other had very extensive ethmoidal cell suppuration as well as antral suppuration. Or expressed in percentages we get the following results: cured, 39.28 per cent.; much improved, 46.42 per cent.; some improvement, 7.1 per cent.; result unsatisfactory, 7.1 per cent.

In this list both hospital and private patients are included; at the same time, I would add that the latter are much more satisfactory than the former, and yield a far higher percentage of complete cure, probably owing to the greater care in keeping the nasal passages clean during the stage of convalescence. Of those that are classified as "much improved" there are a considerable proportion that might be claimed as practically cured of the frontal sinus symptoms, while of others it may be justly urged that the disease was by no means confined to the frontal sinuses and ethmoidal cells. In all the discharge was of long standing, often ten to fourteen years or more, and every patient suffered from severe headaches.

MR. HERBERT TILLEY congratulated the President on his excellent *présis* of the subject, which was so clear that it left but little for other speakers to add. The interest of the discussion centred in that of chronic suppuration of the frontal sinus, either alone or associated with ethmoidal disease, or possibly an overflow into, or suppuration of, the antrum, or of the sphenoidal sinus. As the President said, one could not lay down any particular operation for all cases; the suitable operation must be selected for each case. With regard to lavage in chronic suppuration of the frontal sinus, the question arose, when did an acute case become chronic? He did not know where the line could be drawn, but for himself would set the time at six weeks to two months, after which there was not much probability of getting relief from irrigation, although one might have removed the middle turbinal and provided

free intra-nasal drainage. During the last influenza epidemic he treated five cases by irrigation, and only one of them got quite well. He first saw the cases six or seven weeks after the initial attack of influenza, and the frontal sinuses still suppurated in spite of intra-nasal operations, and he did not think there would be a cure unless an external operation was done, though he did not say that such operation was necessary. With regard to vaccines, his experience had been unfortunate from the point of view of curing the patient. He had had autogenous vaccines prepared, but in the majority of cases the patients had not got well. He thought vaccines would not cure many chronic cases, because when suppuration had been going on for a long time the mucous membrane became so thick, and there was so much hyperplasia of the subepithelial connective tissue, that although vaccination might produce a secretion free from organisms, yet directly the vaccines were suspended and there was the least "cold" or infection, the suppuration returned. There might be temporary relief, but he did not think there was permanent cure. In the last eighteen years he knew of only one case which was absolutely cured by vaccines, and that was one in which the vaccine was prepared and administered by Sir Almroth Wright. Much depended on whether the infection was a pure one. If it were, a vaccine was much more likely to be curative. If a sinus had been suppurating a long time and the infection was a mixed one, he generally maintained there was very little chance of a vaccine doing good, because it could not reduce the excess of mucous membrane and the hyperplasia which he had mentioned. He agreed with the President as to the difficulties of Ingals' operation. He had no right to condemn the operation, as he had not tried it, and he had not performed it because he could not conceive how success could be attained in those cases so common, where there existed not only frontal sinus suppuration, but where the chief trouble was suppurating fronto ethmoidal cells which ran out under the floor of the sinus. He did not think supra-orbital neuralgia had been a prominent post-operative complication in his practice, except in a few patients for a day or two after the operation. With regard to the question of any intervention at all in chronic frontal sinus suppuration, ten years ago one operated on practically all cases in which there was suppuration of the frontal sinus, and many such cases were dealt with in a year: Dr. StClair Thomson and he generally had their hands full of such cases in the Golden Square Throat Hospital. But, as he mentioned at the last meeting of the British Medical Association, the pendulum had now swung back, and he now operated on only four or five cases a year. That change, in his opinion, as to necessity for operation had come about because patients seen fifteen years ago in the higher walks of life who refused external operation, but from whom one who had removed the middle turbinal and made a freer fronto-nasal passage, and then washed them out the sinus, so that the headaches were reduced or cured—such patients seemed satisfied, although some suppuration still persisted. He had treated many such cases, and to-day they were in no worse condition than when he first saw them. It was, of course, true that patients in whom the suppuration persisted were swallowing noxious matter, and such might induce intercurrent complications, but he could only remember three cases of patients having died from the direct result of frontal sinus suppuration which had not been operated upon. He remembered at least a dozen, either in his own practice or those seen in the practice of others, who had died of osteo-myelitis as the direct result of intervention, and these patients before operation had been well except for a discharge of

pus and possibly some headache. After fifteen years of practice one arrived at general principles which guided one's action and practice. And the conclusion he had come to was, that if one freed the middle mental region and the fronto-nasal duct so that one could enter the frontal sinus and occasionally wash it out and keep it clean, one relieved the patient of the headache and made him comfortable. It was better to act in that way than to run the risks attending an external operation. On the other hand, where the discharge was profuse, or other symptoms severe, one should advise operation. Two days ago he operated upon an elderly man who had no symptoms beyond a small displacement of the right eye, causing diplopia. There was found to be a small fluctuating swelling under the right eyebrow, and when that was cut down upon it was found to be full of pus and to communicate with the frontal sinus. The roof of the orbit and posterior wall of the sinus had been destroyed. The patient had not any symptoms except double vision, and yet was in a dangerous condition. He would like to know how Mr. Fletcher Ingals would cure such a patient by an intra-nasal operation.

Dr. STCLAIR THOMSON contended that there was much loose talk still about frontal sinus operations; they seemed to be spoken of as if the frontal sinus operation was to the laryngologist what the operation for appendicitis was to the general surgeon. But, as Mr. Tilley had said, those who had long operated on the sinus now did fewer, not more, operations. He had had sent him the statistics of a large American special hospital, and they recorded only two frontal sinus operations done in the year among the whole staff. It was right to remember that fatal cases had occurred, and still occurred. He had published his own fatal cases, as did Mr. Tilley and Dr. Lambert Lack; and Dr. Logan Turner summarised all published cases in a paper, giving twenty-four fatal cases from the operation. Fatalities might occur from the operation in the very best hands. He felt much less anxiety since he adopted the Killian operation, and he now did not paint the prospects to patients so gloomily as before. Still, the Killian procedure did not exempt from danger. Killian himself had eighty-six cases in his clinic operated upon without a fatality, but before he had completed his 100 cases he had three deaths; these were due to circumstances which might happen to anybody. One was because he had overlooked a sphenoidal sinusitis, and infection spread to the brain. In another case infection had spread up through the middle turbinal. If there were any gentlemen present who had not had a death from the operation, the probabilities were that they would, in time, come to their Waterloo. He had not had fatalities since he adopted the Killian operation, but it was a serious procedure. It was not known what the prospects were if the patient was left alone. At a meeting of the Medical Society of London he had read a paper recording two deaths from untreated sphenoidal sinusitis, giving the full *post-mortem* notes. He had also collected forty cases from literature of deaths from sphenoidal sinusitis which were not operated upon. That was valuable, because there were many cases which were not published, and in which the diagnosis had never been made; the patient had headache after influenza, and died, the death being certified as due to meningitis. Probably many of those cases were meningitis from sphenoidal sinusitis. There were no statistics to go on in regard to the frontal sinus, and he appealed to pathologists to say in every case of death with cerebral symptoms whether every sinus in the head had been examined. He knew of only two cases. One died with abscess in the frontal lobe, and the other would have died if it had not been operated upon. A colleague

in Marseilles said he had followed up ten cases of frontal sinusitis for ten years; only one of the patients was dead, and this death was due to another cause. With regard to cases which should be operated upon, he would keep before him the three indications which the President mentioned. In his own practice headache was the symptom which he placed first in agreeing to operate, because his practice now was to operate in such cases only if asked to do so. There were some cases in which the condition made life unbearable; he had brought three cases of the kind to the meeting. Sometimes the mere diminution of the discharge after operation was more disagreeable than the more plentiful discharge, because it was more inspissated. Some cases would put up with the discharge if the headache ceased and they were able to earn their living. One of the cases shown, a hospital patient, presented a very good result. Intra-nasal treatment had been tried, but failed. He had not seen her for a year, but she never now washed the nose out, and had remained in good health. The second showed how important was a Killian bridge. In that case he made the bridge too thin, so that it cracked and exfoliated. But it was a cure, and the patient was, perhaps, better than any of them, because there was obliteration of the "dead space" behind the bridge. He would conclude his remarks by saying that to have suppuration in the frontal sinus was not so dangerous as had been thought, but that to operate on a frontal sinus was more dangerous than many people imagined.

Dr. DONELAN said he had operated on a great many cases, but he thought on the whole more justice could be done to patients by being more conservative with regard to the radical operation. In illustration he might mention a case of double sinusitis in which he operated on the left sinus four years ago. On the right side only the middle turbinal and some polypi were removed, and by regular douching and occasional injections of nitrate of silver the result seemed quite as satisfactory as that on the left side. He was fortunate so far in not having had a fatal case. He attributed that to the selection of cases of long standing, in which middle turbinectomy had been ineffectual, and to great care in obtaining as aseptic a condition of the site of operation internally and externally as possible. He had no experience of Ingals' operation through the nose, but he had used a tube modelled on that of Ingals', and found it an excellent drain in connection with the Ogston-Luc operation. For retention for more than two or three days he thought it should be made of rubber. With regard to acute cases he had seen a fatal case several years ago during a severe attack of influenza. The patient died of meningitis, and both the frontal and sphenoidal sinuses were found full of pus.

Mr. F. J. STEWARD said that with regard to the acute cases he had found that by simply plugging the middle meatus with a freshly prepared solution of cocaine and hemisine, free discharge and relief of the symptoms had nearly always been brought about. That measure had relieved every acute case he had seen except one, and that was the case of a man with typical symptoms after influenza. In this case he had made a small opening into the sinus, and after washing out the sinus for three days there was no further suppuration. Another point with regard to acute suppuration was, that although the washing out of the sinus appeared to be very useful at times, he was very doubtful as to whether it was often really necessary. If the sinus could drain through the natural opening, after possibly the anterior end of the middle turbinal had been removed, the majority of the acute cases got well without wash-

ing out. And when one remembered how complicated the cavity of the frontal sinus was, with its posterior extensions along the roof of the orbit, with the two walls often practically in contact, it was difficult to believe that washing out could really reach those outlying parts. As to whether the cases cleared up or not he was uncertain, but he thought that a good many did so. In a certain number, however, though they were relieved of their symptoms they continued to have discharge. With regard to the chronic cases, he was convinced that fewer and fewer such cases needed external operation. He thought the fact of the operation being done less often now was due to more pains being taken with the preliminary treatment, namely, removal of the anterior end of the middle turbinate, opening up the anterior ethmoidal cells, and removal of polypi. If that were done persistently, he thought the great bulk of frontal sinus cases would drain satisfactorily. That did not necessarily mean that drainage was entirely dependent on the patency of the fronto-nasal canal. In some cases he thought that might be widely open, and yet drainage would not be efficient. That seemed to be due to the fact that the cavity of the frontal sinus is such a case as that was so complicated that it could not completely drain through the fronto-nasal canal. As showing the value and potency of simple, free, nasal drainage in bringing about cure, he would mention two cases which had made a good deal of impression on him. The first was that of a woman, aged forty-two, who, in August, 1900, came to the out-patient department with severe headache, and all the signs of frontal sinus suppuration. She also had ethmoidal disease. Numerous small polypi were removed, as were also the anterior end of the middle turbinate. But the condition did not improve, and as the headache and tenderness continued she was advised to have an operation done, but refused. She then left London for Manchester, where she remained until 1907, when she again attended, and was found to be completely cured without having had any further treatment. The other case was that of a doctor's wife, who had been under treatment for seven years, had also refused external operation, and had finally got quite well. When operation was done for the condition he thought it should be the most thorough one possible; and unless it was absolutely necessary to avoid deformity as much as possible he did not believe in keeping a Killian bridge, but in removing the entire floor, anterior wall, and all mucous membrane as completely as possible. Thus, he believed, would in the majority of cases, result in a cure.

Dr. D. R. PATERSON remarked, in answer to Mr. Steward's observations, that as complete an operation as he could desire could be done and still keep a Killian bridge. He thought the Killian operation might be improved upon in not being too sparing with regard to detaching the trochlea. He did not hesitate to strip the periosteum as far as the outer part of the orbit so as to get at the temporal recess, where the disease was very apt to lurk and was most difficult to reach. In his last few operations he detached the trochlea to get more room, and the subsequent diplopia was very slight and temporary. Some months ago, in a case where the temporal recess was large, he had to go so far out that it was necessary to put a drainage-tube in the temporal fossa. If one confined oneself to the strict Killian operation it was usual only to go as far as the supra-orbital notch. He had seen the head-bath in action in one of the continental clinics—and the result was excellent; it was a very valuable addition to our methods of treatment for neuralgias of various descriptions. After one or two of his earlier operations there was supra-orbital neuralgia. In subsequent cases he had pulled out the nerve as

recommended by Killian. With regard to the cases which ought to be operated upon, he agreed with the President, Mr. Tilley, and Dr. StClair Thomson, that the most important matter was the persistence of headache and mental depression. With regard to the results of the operation, he had a fatal result after he had operated on thirty such cases. This patient, a man, aged thirty, came into hospital suffering from pan-sinusitis. He was in a very, very miserable condition, the whole of his nose being blocked and the mucous membrane swollen and oedematous. There were no polypi. From the nostrils pus was streaming. Dr. Paterson first opened both maxillary antra, and from that operation there started osteo-myelitis, which spread to the frontal sinuses. These were operated upon, as were the ethmoid and sphenoidal cells, but an illness of eighteen months' duration terminated in death. The point about this case was that it was the operation on the antra and not on the frontal sinuses that set up the osteo-myelitis. A few months afterwards he met with a very similar case in a girl, who had a swollen, oedematous condition of the mucous membrane, with pus pouring from both nostrils, and pan-sinusitis. After explaining the risks to her she declined to have anything done, and she died six months later of some intercurrent affection. He suspected that such cases were not uncommon: there were cases where the disease was such that it led to lowering of the system, so that comparatively trifling affections caused death. In judging whether a particular patient should be operated upon or not, one had to bear in mind on the one hand the effect which the general disease, with its continuous discharge, had upon the general health, and on the other the risk of starting an osteo-myelitic process by operation.

Mr. CHICHELE NOURSE thought it a matter for congratulation that the President had given such an excellent *résumé*, because it showed at a glance the chief points of the subject. He recalled that in the year 1899, at the meeting of the British Medical Association at Portsmouth, when he reported work which he had been doing on the treatment of frontal sinus suppuration by means of injections through a cannula passed into the frontal sinus from the nose, which he then thought might prove successful, this mode of procedure was deprecated by some of the speakers as being less safe than a radical operation. Since then time and increased experience had led to a modification of views on all sides. For his own part he found that although the use of injections might check the discharge of pus and produce an apparent cure, yet it was, as a rule, merely palliative; that the disease was rendered latent, but that the discharge was liable to recur from trivial causes. He was able to confirm the observations of the President that the fronto-nasal canal was often unusually patent in cases of chronic suppuration of the frontal sinus. It was clear, also, that free drainage alone was not sufficient to lead to cure of the disease when the mucous membrane was in a state of degeneration, although a want of free drainage might have been one of the factors which led to its development in the first instance. Under such circumstances nothing but a radical operation would get rid of the disease. It was yet a matter of doubt whether one would be justified in leaving the patient unoperated on whose frontal sinus contained a vascular and oedematous lining with infective microbes, not only on its surface, but embedded in its substance. Without asserting that one should operate in all cases, he thought in the cases coming under the three headings which the President had enumerated operation should certainly be done. Persistent headache, although a sign for operation, did not seem, as far as his experience went, to be due to retention of

discharge, but was caused in some other way. The Ogston-Luc operation was that with which he had had most experience. So far he had been fortunate enough not to have had a fatal case. If he had, he would have felt bound to publish it. The chief danger seemed to be re-infection of the operated area from other septic foci in the nose or other accessory cavities. In order to obviate that he had adopted the method of passing a tightly fitting drainage-tube from the sinus through the fronto-nasal canal, and leaving it projecting from the nasal orifice in such a way that the healing sinus was cut off from every source of infection, until the denuded surface of bone had become covered with granulations. The tube was left in place for ten days or more. Some force was required to introduce it, and though it caused pain in one or two cases, it was usually borne well. He had had no case of osteo-myelitis after operation. After removal of the tube the fronto-nasal canal sometimes became obstructed with granulations and the wound temporarily re-opened at the inner angle, but it soon closed again.

Dr. DAN MCKENZIE said that out of the details of the discussion would emerge one striking point—namely, that there had taken place in the last three or four years a definite subsidence of the high tide in favour of the external operation which was done for the condition. That would render the present discussion historical, and it fully justified the holding of it. What had caused that change of opinion? The first reason was that the best operation under the best circumstances, and with the best operative results, did not invariably lead to the cessation of the suppuration. Secondly, that under the best circumstances, and with the best operators, a patient who had submitted to frontal sinus operation for a comparatively trivial cause might die—the cause of death being osteo-myelitis in most cases, and not meningitis from injury of the cribriform plate. Here was a point in which there was need for further research. What was that osteo-myelitis, and why was it so frequent in operations on the frontal sinus? Very little had so far been learned as to its pathology or ætiology. That day a case had been reported in which death occurred from a Killian operation, the cause of death being, it was said, infection from the sphenoidal sinus. But there was scarcely an occasion on which the frontal sinus was opened in which some lurking focus did not persist after the operation; it was impossible to make quite sure that every vestige of suppuration had been removed; yet, in spite of that, only a few cases became infected with conditions which led to death. What was the circumstance which led to osteo-myelitis in those few cases? On comparing frontal sinus operations with mastoid operations in this respect there was found to be a vast difference. But it was not yet known why osteo-myelitis happened more frequently after frontal sinus operation than after mastoid operation. That matter should be investigated, because it was unsatisfactory to go on washing out their patients week after week, or month after month. If osteo-myelitis was inevitable in some cases, it was important to know why. But the disease might be due to something which a better acquaintance with its pathology would enable surgeons to avoid. He agreed with all that had been said in the discussion as to being conservative in frontal sinus operations, because he had had a death from osteo-myelitis; and anyone who had had an experience of that kind would not readily forget it. It was an experience which would lead him to go on washing out for a long time rather than submit a patient to the risk of a fatal ending as a result, not of the disease, but of the operation.

Dr. IRWIN MOORE said he had had considerable experience in chronic

frontal sinus suppuration, having had the opportunity of working with Dr. StClair Thomson. He brought forward two cases to-day to enable a comparison to be made between the older operation and the complete Killian. In the latter case, which was only operated upon two months ago, the patient might be said to be completely cured. She had had persistent headache for eight years and chronic nasal catarrh, and a very fetid maxillary antrum on the same side. She was a nurse, and could not follow her profession except a few small cases, and she believed she would return to full work in a few months' time. The other patient had previously had one frontal sinus operated upon by the Ogston-Luc method: he found that sinus still suppurating, and three channels discharging from it; also a suppurating frontal sinus on the other side. Both ethmoids were crowded with polypi and pus, as also were both maxillary sinuses. He operated upon all four sinuses, and it had only been a partial success, because he did not do a complete Killian, but followed out the lines of the old incision. There was still more to be done on the right frontal sinus, though both maxillary sinuses were cured. In treating chronic frontal sinus suppuration, having decided to operate, it was important to do a complete and thorough operation.

Dr. ADOLPH BRONNER said he was glad to hear members conclude that frontal sinus disease should not be operated upon unless it was a matter of urgency. He had a case of osteo-mycelitis twenty-three years ago, and had been somewhat afraid to do the operation since. He only performed Killian's operation in urgent cases, or when there was a fistula. Cases died not only of post-operative osteo-mycelitis, but of broncho-pneumonia. Recently there was a well-known case of death from operation on the maxillary antrum. He asked whether members had tried placing aseptic wax over the bare bone to prevent osteo-mycelitis. His own opinion was that that would lead to the condition rather than prevent it. He suggested removing the lower wall and only part of the anterior wall, leaving the wound open for a few days, and then filling up the sinus with wax to prevent deformity. He always removed the middle turbinate, and asked the patient to come once a week, because small polypi grew quickly and prevented free drainage. In a few weeks there was generally no recurrence of the small polypi and of the swollen mucous membrane, and free drainage and cure took place without the radical operation. Patients said that menthol (10 per cent. spray) was very comforting, and that it relieved the headache and prevented recurrence of the local pains.

Dr. DUNDAS GRANT reminded the Section that the first case brought before the Laryngological Society of London was one of chronic frontal sinus suppuration, treated by him by the Ogston-Luc method. He had also from time to time brought forward cases of operation carried out by Killian's method, but from first to last he had been a very strong advocate for intra-nasal treatment. He was surprised that there had been no reference to the use of aspiration in the treatment of acute cases of sinusitis, as he had brought before the Society Sondermann's apparatus for effecting it. It had, however, to be preceded by the application of cocaine and adrenalin, as mentioned by Mr. Steward. Dr. Grant narrated the case of a middle-aged gentleman whose frontal pain rendered him almost maniacal. After the application of cocaine and the exercise of suction by means of Sondermann's apparatus, relief from pain and complete calmness followed. A more efficacious instrument for introducing into the nose had since been devised by Mueck, but aspiration could also be practised by the patient pinching his nostrils and making a strong

inspiratory effort. In another similar case, where the symptoms were extremely violent, relief was effected by the removal of the swollen anterior extremity of the middle turbinated body. In regard to chronic frontal sinus suppuration, Dr. Grant had brought several cases before the Society, and in one in which he had recommended operation and the patient refused it, cure eventually took place apparently as the result of repeated injection of mentholised liquid vaseline. In another case the relief of headache was obtained immediately when dilatation of the infundibulum by means of bougies was practised. The patient learnt the art of irrigating his own frontal sinus, and kept the discharge in check. In one case a deflection of the septum had to be removed in order to render the introduction of a catheter into the frontal sinus possible. He considered the most perfect operation to be Killian's, the whole of the anterior wall being left, and not merely the part internal to the trochlea, and that many of the cases which recovered as the result of a simple Ogston operation were likely to have recovered without it. With regard to fatal results as the result of osteo-myelitis, he had only seen two. One was a case in which he was not called in until already the pus had made its way through the anterior surface of the frontal bone; the other was the one which Dr. Dan McKenzie had narrated. Apparently every operator was sure to meet with it some time or other, but he did not think that Dr. McKenzie need be discouraged from carrying out the operation in suitable cases, as it would probably be a very long time before he would meet with such another. Dr. Grant narrated a case in which he had performed what was apparently an exceptionally successful Killian operation from the artistic point of view, but the pain still persisted, though, indeed, the discharge disappeared. It was temporarily relieved by resection of the supra-orbital nerve, and then again by free opening of the sphenoidal sinus: the pain centred itself in the opposite frontal region, and Dr. Grant had recently opened this other frontal sinus, finding it full of granulation-tissue. He was glad to find that members of the Section were coming round to the views which he had always strongly advocated in regard to a hopeful conservatism and the efficient trial of intra-nasal methods of treatment; when these failed he advised a complete radical operation, and considered Killian's method the best.

Mr. STUART-LOW said that as regards the treatment of acute frontal septic antritis, the best procedure consisted in relieving tension in the nose and sinus by reducing the cedema and swelling in the middle turbinal region by packing the nose with cotton-wool plugs soaked in adrenalin and cocaine solutions. This constituted a temporary treatment, and should be followed up with the removal of the anterior half or two thirds of the middle turbinal in most instances. With regard to chronic frontal septic antritis, Mr. Stuart-Low said that after a large experience of these cases treated by surgical measures, he had come to look upon thorough intra-nasal treatment as a preliminary step to be of the most essential importance to securing a successful result. The anterior two thirds of the middle turbinal must first be taken away, and any swelling in the neighbourhood of the hiatus semilunaris reduced—*i. e.* the anterior lip or the ethmoid bulla made of normal dimensions, if enlarged. Should these means fail to bring about efficient drainage, then the best thing to do was to perform the Ogston-Lue operation. If this were done thoroughly and efficiently, and a large-sized rubber drainage-tube fixed at the lowest point of the frontal sinus and drawn down into the nose, as usually practised by Mr. Clichele Nourse, good drainage would be

established. Mr. Stuart-Low had shown some of his successes at the meetings of this Society from time to time, and he had never seen a case in which this method of treatment had not been sufficient to cure the patient. He deprecated such extensive and hazardous operations as Killian's and Watson-Williams's, and did not consider that they would ever be required if thorough and intra-nasal and properly performed Ogston-Luc operations were carried out.

Mr. WAGGETT stated that in his experience acute frontal sinusitis invariably cleared up under conservative treatment, an important element in which was confinement to bed for a few days. With regard to chronic empyema, in his experience the vast majority could be effectually dealt with by the intra-nasal methods. In certain cases the external method was undoubtedly indicated, and in such cases the Watson-Williams operation gave a remarkably free access.

Dr. KELSON thought that fatal osteo-myelitis on the one hand and deformity on the other had combined to render external operation on the frontal sinus less popular than formerly.

Dr. H. J. DAVIS pointed out that no allusion had been made to a clinical fact, which was, that the acuter, *i. e.* the more recent the sinusitis, the greater the chance of recovery, and the more chronic the sinusitis the more difficult it was to cure. This applied to affections of the other accessory sinuses as well.

The PRESIDENT, summing up the discussion, said that the result of the discussion appeared to be to consolidate and confirm the guiding principles of treatment that he had outlined in his opening remarks, and which he believed freely represented the views of the majority of present-day rhinologists. He congratulated those members who had brought patients upon whom radical operations had been performed, and the exceedingly good results obtained both from the curative aspect and on the absence of any disfiguring cosmetic defects, and he believed that these results were unsurpassed by any other operators. He also thanked those members who had again directed attention to their fatalities from osteo-myelitis. As he had already mentioned, he himself had had the good fortune to escape this dreaded complication, but he recognised that this was not due to any skill on his part, and through no controllable cause his results in future might be marred from its occurrence. But the instance mentioned by Dr. Paterson in which death was due to osteo-myelitis without operative interference reminded them that patients might be exposed to the gravest risks from the disease itself, and one should not therefore unduly magnify the risks of operation. He was interested in Dr. Bronner's suggestion, and had tried packing the cavity of the sinus with an antiseptic wax after it had been cleared of all trace of mucous membrane. With regard to the examples in his own method of radical operation on the frontal sinus that were shown on the lantern-screen, he wished to thank Dr. Waggett for reference to one case at which he was present, in which two enormous suppurating sinuses were dealt with, and he proposed to show the patient at the next meeting at Bristol. He reminded the members of a case recently shown by Mr. Charters Symonds, in which his method of operation had cured the patient and left no visible scarring. Dr. Lambert Lack had also adopted this operation in a case, and he reported with good result.

PROCEEDINGS OF THE SCOTTISH OTOLOGICAL AND LARYNGOLOGICAL SOCIETY.

May 20, 1911.

Chairman, DR. THOMAS BARR.

Report by DR. W. S. SYME (Glasgow).

PATIENT WHO WAS OPERATED ON TWENTY-FOUR YEARS AGO FOR OTITIC TEMPORO-SPHENOIDAL ABSCESS.

BY DR. THOMAS BARR.

W. H.—, male, aged thirty-four. In January, 1887, when ten years of age, he came under exhibitor's care presenting the classical symptoms of uncomplicated right temporo-sphenoidal abscess supervening on purulent discharge from right ear of one year's duration. At the request of the exhibitor, who knew of Barker's case of a few months previously, Sir William Macewen operated, trephining an inch above the meatus with a counter-opening in the roof. A large abscess was evacuated, and complete recovery followed. The man is now in excellent health both bodily and mentally, and follows his occupation of brass-founder. The case was fully reported in the *Lancet*, March 26, 1887, and is of historic interest as being one of the first of the kind.

A PATIENT NINE YEARS AFTER THE INJECTION OF MOLTEN PARAFFIN TO REMEDY DEFORMITY OF THE NOSE.

BY DR. WALKER DOWNIE.

Woman, aged twenty-one. Eleven years ago she received a severe blow on the nose, followed apparently by abscess of the septum and subsequent extensive necrosis. A saddle-back deformity resulted. In March, 1902, the normal shape was restored by the subcutaneous injection of molten paraffin, melting-point 108° F. Patient shows the improvement which follows the judicious use of paraffin injected subcutaneously in cases of deformity of this nature, and where the skin over the part is healthy. The paraffin lies inert, gives rise to no local discomfort, does not tend to migrate nor to become absorbed, and the improvement effected is permanent.

In reply to Dr. Turner, Dr. DOWNIE said he was still using molten paraffin, and saw no reason for discarding it in favour of solid paraffin. With careful precautions for localising it at the time of injection he did not fear its migration into other parts, nor did he think it possible, as in a case referred to by Dr. Fraser, that severe heat, such as in the engine-room passing through the Red Sea, would cause a rise in temperature of the tissues of the nose sufficient to liquefy injected paraffin with the melting-point of 108°, such as he used. Replying to Dr. Thomas Barr, he stated that, in what was now a very considerable experience, he had never had a personal case of injury to the optic nerve leading to blindness, though, of course, he was aware that such a misfortune had been

reported. He thought in such a case the paraffin was injected with too great pressure and without sufficient care in compressing the surrounding tissues to localise it.

PATIENT FROM WHOM A LARGE FIBROUS POLYPUS WAS REMOVED
FROM THE NASO-PHARYNX.

By DR. WALKER DOWNIE.

A boy, aged fifteen, came to the Western Infirmary two months ago with a history of nasal obstruction and of several attacks of severe bleeding from the nose. Two years ago he is said to have had some mucous polypi removed. When seen he had mucous polypi in his left nostril, and the naso-pharynx was filled with a firm growth, which extended into the left naris and downwards into the buccal pharynx. He was admitted into hospital and operated on under chloroform on April 12. The wire *écraseur* was passed through the left naris, the loop of the cable wire being guided round the growth by the finger in the pharynx and pressed up to the vault. It was then slowly tightened, and the growth was torn from its attachment and removed through the nose. As is usual in these cases the hæmorrhage was sharp, but it was easily controlled. Dr. J. S. Dunn, of the Pathological Department, reported its histological structure to be that of a simple fibroma with somewhat numerous well-formed vessels.

PATIENT OPERATED ON FOR SARCOMA OF THE ETHMOID, BILATERAL.

By DR. WALKER DOWNIE.

C. C.—, male, aged twenty, was first seen in November, 1906. Prior to this he had had several polypi removed from his nose by a doctor in the country. The nose was more than usually prominent from hypertrophy and distension of the nasal bones, and the eyeballs were displaced outward. Both nasal fosse were completely blocked by large, pale, firm growths. These were numerous, some sessile, some pedunculated; they had the appearance of ordinary mucous polypi. They bled readily, however, on using the probe, and even a liberal application of cocaine did not prevent pain when their removal was attempted. So on December 1 they were thoroughly removed under chloroform. They were found to spring from, and in large measure to replace the lateral masses of, the ethmoid, extending upwards to, but not involving, the cribriform plate. The septum was unaffected. Recurrences took place, and the growths were removed as they appeared, but nothing further has been done to him during the past fifteen months. The growths have been examined after each operation. First report from pathologist: "These have evidently been purely myxomatous at first, but now the character of the tumour is changed in several parts. In the firmer portions the myxomatous nature is lost, the tissues being cellular, the type of cell being the small round cell. There is little doubt that this is a sarcomatous change in an otherwise innocent growth." Two months later: "Undoubtedly myxosarcoma." One month later: "These polypi give the same result as before; if anything they are more markedly sarcomatous." Recurrences became less frequent, and the last growth removed fifteen months ago was declared to be simple myxoma.

Dr. DOWNIE agreed with Dr. Adam that there was now a recurrence

in the left nostril of what appeared to be simple polypi. These had appeared during the past few days.

Dr. SYME remarked on the loose way in which the description "myxoma" was applied by pathologists to the structure of simple nasal polypus. In this case there had evidently been a sarcomatous change in simple nasal polypi. Pure myxoma was a rare condition in the nose.

PATIENT FROM WHOM A LARGE SUBGLOTTIC PAPILLOMA WAS REMOVED BY THYROTOMY.

By Dr. WALKER DOWNIE.

B. L.—, male, aged forty-seven, a coal-miner, was admitted to the Western Infirmary on March 6, 1911, suffering from hoarseness, breathlessness on exertion, and difficulty in speaking of fifteen months' duration, due, he thought, to catching cold.

Examination.—The tongue was somewhat coated, breath most offensive, fauces and pharynx normal. On laryngoscopic examination it was seen that the left cord did not move, and attached to its free border and under aspect was a large growth, cream-coloured, covered with sordes but not ulcerated. In view of the fixation of the cord and the foul appearance of the growth an external operation was decided on so that complete removal might be accomplished. On March 10, 1911, under local anæsthesia, thyrotomy was performed and the tumour, which appeared to be a papilloma with a broad base of attachment, was carefully clipped away. Trichloroacetic acid was applied to the raw surface and the larynx immediately closed entirely. On the fifth day the patient developed delirium tremens, and on inquiry it was learned that he was a constant and heavy drinker. The part healed satisfactorily, and he was dismissed on April 11. Pathologist's report: "Simple warty papilloma." The voice is now as clear as ever it was, patient says, and the left cord moved freely. Within the last few days a round tensile swelling has appeared in front of the larynx in the position of the scar.

Replying to Dr. Kelly, Dr. Downie stated that he did not use the direct method in operating on this patient because of the foul appearance of the tumour, and because he considered that only by an external operation would it be possible to completely remove the growth.

Dr. BOOTH and Dr. TURNER pointed out that the left cord was still congested though it moved fairly well and the latter voiced the opinion of other members in saying that in spite of the pathologist's report the case should be carefully watched for the appearance of signs of malignancy.

PATIENT WITH BILATERAL ABDUCTOR PARALYSIS SUBSEQUENT TO PLEURISY WITH EFFUSION: TRACHEOTOMY TO PREVENT SUFFOCATION.

By Dr. WALKER DOWNIE.

T. M.—, male, aged thirty-nine, admitted to the Western Infirmary in September, 1909, under the care of Dr. Ness, suffering from right-sided pleurisy with effusion. This did not extend to the apex, which remained throughout resonant on percussion. His chest was tapped and

forty ounces of fluid removed. Subsequently the chest cleared up satisfactorily. In December, 1909, however, he began to have attacks of difficulty in breathing of the nature of laryngeal spasm. Inspiration was seriously obstructed and was accompanied by a crowing laryngeal sound. His cough was brassy in character. He was then seen by exhibitor and a bilateral abductor paralysis was discovered. On repeated examination no cause could be found for this. Patient was put on iodide of potassium and was kept in bed. No improvement resulted and the spasmodic attacks became more frequent. He was then transferred to the Throat Department, and on March 10, 1910, tracheotomy was performed under local anaesthesia and a Foulis' tube introduced. This he has worn constantly since.

Dr. FRASER asked, with reference to Semon's law, if any member had ever watched the case in which an abductor paralysis had gone on to complete paralysis leaving the cord in the cadaveric position. One saw cases of abductor paralysis and cases of complete paralysis, but he would like to hear of a case where the transition had been observed.

Dr. DOWNIE said he could remember such a case, though, at the moment, only one. This was a man who was under the care of the late Dr. Finlayson. When first seen he had a unilateral abductor paralysis. He could sing well, and, indeed, added to his livelihood in this way. Some time afterwards he returned to the hospital complaining of loss of voice, and it was then seen that the cord was completely paralysed and was lying in the cadaveric position. Unfortunately Dr. Downie could not say how long a time had elapsed between the two periods.

A WOMAN WITH CONGENITALLY SHORT PALATE; SPEECH DEFECTIVE BUT DEGLUTITION UNIMPAIRED.

By Dr. WALKER DOWNIE.

Dr. KELLY remarked that this was a case of submucous cleft palate. He did not think that, as Dr. Love suggested, education of the palate would lead to a cure of the insufficiency in a case such as this where the defect was marked. He asked if Dr. Downie had ever injected paraffin into the posterior pharyngeal wall to lessen the distance between that part and the edge of the palate. He himself had never done so though it had been recommended.

Dr. DOWNIE replied that he had no experience of the use of paraffin for this condition.

PATIENT WHO HAD BEEN OPERATED ON FOR CHRONIC FRONTAL SINUSITIS WITH EXTENSIVE NECROSIS OF THE OUTER TABLE OF THE FRONTAL BONE.

By Dr. WALKER DOWNIE.

Male, aged thirty-six. Nasal polypi removed six years ago. Purulent discharge from nose for years. In December, 1910, a swelling appeared in middle line of forehead midway between root of nose and edge of hairy scalp. This slowly increased in size, but it was not painful, and a month later he found that when he pressed it matter came into his nose. On examination this was confirmed, pus escaping into both nasal fossae, into right more than into left. Operated on February 8, 1911. On account of the extent of the necrosis the cavities were packed and the wound only partially closed. Healing had progressed satisfactorily.

FATAL CASE OF CEREBELLAR ABSCESS SECONDARY TO INFECTIVE PAN-LABYRINTHITIS; RUPTURE OF THE ABSCESS INTO SIGMOID SINUS; SEPTIC THROMBOSIS OF SIGMOID SINUS; DEATH FROM PURULENT LEPTOMENINGITIS.

BY DR. J. STODDART BARR.

J. Y —, aged thirteen. Admitted to Ear, Nose and Throat Hospital, Glasgow, on November 9, 1909, suffering from headache, severe pain in right ear with tenderness over lower part of mastoid; temperature 100.4° F., pulse 84; no optic neuritis. Horizontal nystagmus on extreme lateral deviation of eyes, especially to the left, the healthy, side; no vertigo, but static tests indicated a tendency to fall to the right side; knee-jerks exaggerated; no ankle clonus. Kernig's sign absent, profuse foetid discharge from right ear, meatus filled with granulation-tissue, watch not heard even on pressure, Rinne's test negative, but other tests indicated defective bone-conduction on right side. Ten days prior to admission patient was struck on the head by a football, and four days later complained of pain in and behind right ear, with nausea and vomiting. Subsequently headache, vomiting and one rigor.

Radical mastoid operation on November 11: Cholesteatoma and granulation-tissue; facial nerve exposed, fistulous opening into external semicircular canal, stapes loose in granulation-tissue: stapes removed. During next five days, earache and headache, temperature slightly irregular, pulse normal, vomiting occasionally, facial paralysis, increasing nystagmus on deviation to healthy side.

Double vestibulotomy on November 16: Extensive pan-labyrinthitis. Lumbar puncture: fluid semi-turbid, excess of polymorphs, capsulated diplococci. During next six days headache, increasing emaciation, drowsiness, nystagmus more marked on deviation to the right (affected side). Lumbar puncture: fluid clear. Cerebellar abscess evacuated through Whitehead's triangle on November 22, followed in three days by counter-opening behind sigmoid sinus. Sinus appeared healthy.

Patient's condition now improved greatly, headache disappeared, also nystagmus; slight paresis of the right hand developed. On November 29 rigor and high temperature; repeated on day following. Right internal jugular vein ligated and upper end brought out; sinus opened; semi-solid purulent clot; ragged aperture on inner wall of sinus leading into cerebellar abscess cavity. Death six days later; purulent leptomeningitis. Temporal bone and sigmoid sinus shown.

PATIENT AFTER OPERATION FOR SUBDURAL AND CEREBELLAR ABSCESS:
NO LABYRINTH INVOLVEMENT.

BY DR. J. STODDART BARR.

P. T. MA —, aged twenty-four. Admitted to Glasgow Ear, Nose and Throat Hospital on April 8, 1910, suffering from headache, rigidity of back of neck. Temperature 99° F.; pulse normal. Slight horizontal nystagmus on extreme deviation to right (affected side); no vertigo; no optic neuritis; partial destruction of right tympanic membrane. Discharge neither excessive nor foetid; bone-conduction good. Intermittent otorrhea from right ear for ten years. Twelve weeks previously received blow behind right ear from snowball; four weeks later severe frontal and occipital headache; pain and stiffness in back of neck. For last three weeks headache, frequent vomiting, two slight attacks of

vertigo. Slight rigor on day of admission. Radical mastoid operation two days after admission. Posterior wall of antrum necrotic, showing gap exposing dura mater in which was a ragged aperture leading into large subdural space containing only a little pus. Patient improved greatly, temperature subnormal for six days, then sickness and vomiting renewed with severe headache, tongue foul, slight vertigo, nystagmus to affected side much increased. Cerebellar abscess evacuated through Whitehead's triangle on November 17; over an ounce of non-fœtid pus; mixed staphylococci. Vaccine prepared, and first dose (fifty millions) given next day. Repeated and increasing doses every eight days. Uninterrupted recovery; wound cavity quite dry on April 26, 1911. Hearing better in right than left. Caloric test (hot water) showed good vestibular reaction.

A question of Dr. PETERKIN's in reference to these two cases gave rise to a discussion, in which several members took part, as to the diagnostic significance of the nystagmus. Special stress was laid on the change of the direction of the ocular movements. In a case of suppurative labyrinthitis, with nystagmus towards the healthy side, if the direction of the nystagmus should change towards the opposite side this would be strongly suggestive of the formation of a cerebellar abscess on the side of the ear disease. Cases in support of this were quoted.

Dr. THOMAS BARR drew attention to the benefit which seemed to follow the use of an autogenic vaccine in the second patient.

PATIENT TWO YEARS AFTER OPERATION FOR CARCINOMA INVOLVING THE LEFT ETHMOIDAL LABYRINTH.

BY DR. J. STODDART BARR.

D. C.—, aged forty-nine. Constant discharge, sometimes purulent, from left nostril for some years; nasal obstruction on same side for one year; polypi (?) removed four times. Neuralgic pain over left cheek and forehead extending into left ear; no epistaxis; general health not good; loss of weight. Nasal examination on April 8, 1909: Left nasal passage filled with dense polypoid masses without typical appearance of ordinary nasal polypi; no tendency to bleed; muco-purulent discharge. Left maxillary antrum dark on transillumination; no pus, however, on washing out. Part of growth removed for examination. Dr. Leslie Buchanan reported true carcinoma. Growths originated in ethmoidal region. On April 23 entire ethmoidal labyrinth curetted. Diseased tissues examined by Dr. Teacher, who confirmed carcinomatous nature.

PATIENT AFTER OPERATION FOR CHRONIC FRONTAL SINUSITIS. DRAWINGS TO ILLUSTRATE EXHIBITOR'S METHOD OF USING THE SOFT TISSUES TO OBLITERATE THE BONY CAVITY.

BY DR. J. STODDART BARR.

The soft tissues are split, one layer being pressed up beneath the bridge, the other covering the bridge: the space between the two layers quickly fills up.

Dr. TURNER thought the result in this case was good, but that as a rule the result would not differ from that obtained by the ordinary method.

CHRONIC EDEMA OF FACE IN A FEMALE, AGED TWENTY-FOUR.

BY DR. J. ADAM.

When first seen in 1909 patient had had for four years edema affecting left cheek, upper lip, left ala of nose; fissures and crusts inside left nostril and on frenum of lip. Under vaccine and other treatment the condition subsided. A few months later the right side of face became similarly affected; purulent disease of right antrum appeared and was treated by infra-turbinal opening, a cure resulting and with improvement in the edema. This later, however, again became worse, the lip especially being involved. Culture from puncture of lip showed streptococci. The teeth became rapidly carious; dental and vaccine treatment resulted in improvement.

TWO CASES OF ATROPHIC RHINITIS BEGINNING IN ADULT LIFE.

BY DR. J. ADAM.

(a) Engineer, aged twenty-three, first seen in 1907. Complained of crusts, slight fetor from both nostrils for two years, right worse. A brother was similarly affected. Right nasal fossa wide. Septal deflection to left, some atrophy of right inferior turbinal, epithelial metaplasia, fibroblasts, few glands with round-cell infiltration. Abel's bacillus found. No sinusitis detected, though left antrum transilluminated badly. Treated by ionisation with argyrol. Improvement resulted and for some months crusting ceased. Recurrence; septum resected in 1908; cartilage very thin. Improvement; discharge thin and less in quantity.

(b) Woman, aged thirty-five, with pronounced mitral disease. Is emphatic that nasal discharge did not begin till about four years ago; blames her dusty occupation as caretaker of a hall. Left nasal fossa much the wider and more affected. Transillumination clear. To have paraffin injection.

Dr. FRASER doubted if one could accept patient's statements in regard to the period of the commencement of a nasal discharge, but Dr. ADAM stated that in the female patient, at any rate, his own observation confirmed the history given by her. She had been under his care for another condition for some years, and he had frequently had occasion to examine her nose.

PATIENT SHOWING IMPROVED HEARING AS A RESULT OF THE RADICAL MASTOID OPERATION.

BY DR. J. ADAM.

Girl, aged seven. Fetid discharge for three years from right ear. Whisper six feet. Membrane almost completely destroyed. Ossicles not seen. Little improvement after prolonged permeal treatment. Radical mastoid: Ossicles found displaced backwards. Result: Hearing improved; whisper twelve feet.

Dr. KERR LOVE remarked on the improved hearing in this case, and suggested that too thorough curettage of the tympanum in the radical mastoid procedure had a bad effect on the hearing by leading to the growth of fibrous tissue in the region of the footplate of the stapes. He urged that it was not wise to include systematic curetting of the tympanic cavity in the radical mastoid operation, but to carry this out in the after-treatment by way of the meatus.

Dr. FRASER made some observations on the relative value of the oval and round windows for the transmission of sound-waves, and inclined to the opinion that results of operation on the tympanum, as, for example, in the radical mastoid operation, supported the view that normally the waves passed by the round window, while the membrane of the oval window with the footplate of the stapes was brought into movement by the rebound from the labyrinth, the ossicles and their muscles serving to regulate the intra-tympanic pressure and to put it into the best possible condition for appreciation of sound by the internal ear. He cited a case after operation which seemed to confirm this view.

Dr. SYME referred to experiments detailed by Bárány in *Les Archives Internationales de Laryngologie*, etc., for November, December, 1910. Bárány made use of mercury instead of paraffin as used by other observers to close the fenestra rotunda. The communication was an interesting one but the results appeared to be inconclusive.¹

PATIENT OPERATED ON FOR POLYPI ARISING FROM THE INFERIOR TURBINALS.

By Dr. J. ADAM.

Woman, aged thirty-nine; nasal obstruction for nineteen years; both nasal fossie full of polypi, springing chiefly from region of inferior turbinals, especially right. Septum deviated to left, especially posteriorly. Left antrum full of pus. Polypi removed; septum resected; antrum opened below inferior turbinal. Pus now absent. The microscope showed the structure of mucous polypi.

(To be continued.)

INTERNATIONAL CONGRESS OF MEDICINE AT BUDAPEST.

August 31, 1909.

SECTION OF LARYNGOLOGY AND RHINOLOGY.

(Continued from p. 271; see also p. 151.)

THE TREATMENT OF SUPPURATION OF THE NASAL ACCESSORY SINUSES.

By Dr. HAJEK.

The difference between acute and chronic disease must first of all be made. The distinction between them is not absolute, since severe acute disease now and then necessitates radical interference. In most acute cases rest in bed, aspirin, Brüning's light bath, cocaineisation of the ostia, positive and negative air-pressure by means of Politzer's bag, or Sonderrmann's aspiration suffice to bring about cure. In the treatment of chronic empyema (*a*) of the maxillary antrum, the following may be employed: (1) Systematic lavage through the ostium maxillare and

¹ See also JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY, vol. xxv, p. 491.

through the inferior meatus of the nose. (2) Cowper's operation through the alveolus in empyema of dental origin. (3) The modified Mikulicz operation in the milder chronic cases. (4) The Caldwell-Luc radical operation in the severer cases. (b) Frontal sinus: Cases with actual or impending complication must be distinguished from cases free from complication. For the latter, endo-nasal treatment is enough; for the former radical operation is imperative. (c) The ethmoidal labyrinth: In chronic uncomplicated cases intra-nasal treatment with snare, hook and curette; in severe cases the radical operation is called for, consisting of either the Killian resection of the nasal process of the superior maxilla or else the route through the antrum after Jansen and Furet. In disease of the greater part of the bony framework, Guisez' ethmoidectomy is indicated. (d) Sphenoidal sinus: In chronic cases lavage is quite sufficient. If the orifice is too narrow it should be enlarged. In severer cases the author's mode of removing the posterior ethmoidal cells and the anterior wall of the sphenoidal sinus should be employed. External operation on this sinus need not be considered unless in severe and complicated cases.

THE INTRA-CRANIAL AND CEREBRAL COMPLICATIONS OF ACCESSORY SINUS DISEASE.

BY DR. A. ONODI (Budapest).

After a description of his researches upon the thickness and strength of the cranial walls of the various sinuses and a statement of the relationships to each other of the venous trunks and plexuses in the sinuses and in the meninges, the author proceeded to detail illustrative cases. To Gerber's statistics of the intracranial complications of frontal sinus suppuration he added three cases of brain abscess and one case of serous meningitis. To Gerber's seven cases of brain abscess cured by operation he added one case, the eighth on record; and to Dreyfus' statistics of ethmoidal complications Onodi added one—a case of brain abscess.

INTRA-CRANIAL COMPLICATIONS OF NASAL ORIGIN.

BY W. FREUDENTHAL (New York).

Report of Cases.—(1) Acute frontal sinusitis; pus retention; caries of posterior sinus wall. Dura bulging into sinus opened and pus evacuated; death (case already published in America). (2) Frontal sinusitis after influenza. Extradural abscess. Abscess opened. In the following days fever, headache, and apathy. Wound reopened; dura bulging, opened, and pus found; recovery. (3) Acute empyema of sphenoidal sinus; extension to other sinuses and abscess of temporal (and frontal?) lobe. (4) Regionary metastases from frontal sinus (and sphenoidal?).

INTRA-NASAL DRAINAGE OF THE FRONTAL SINUS.

BY FLETCHER INGALS (Chicago).

The author described his well-known method of opening the frontal sinus through the nose. The operation is applicable to 95 per cent. of all cases, and 95 per cent. of cases operated on in this way are cured in from two weeks to six months.

THE CONSERVATIVE TREATMENT OF ACCESSORY SINUS SUPPURATION.

BY DR. WEIL (Vienna).

The author showed a patient who sixteen months previously had been suffering from violent frontal sinus symptoms, and who, after resection of the middle turbinal, learned to wash out the sinus himself, and had been well ever since.

Dr. PACNZ (Budapest) had twice seen cerebral complications—once in ethmoidal disease and once in a case of antrum, ethmoidal and frontal sinus suppuration. Both were cases of abscess of the frontal lobe and meningitis, and, in spite of operation, both died.

Dr. JOACHIM (New Orleans) reported a case of metastatic brain abscess in a case of frontal sinus suppuration. The abscess was situated 4 or 5 cm. from the sinus, and there was no evident communication between them.

Dr. JÓVÖLGYI (Budapest) had seen one case of frontal sinus disease in which cerebral complications were relieved and got rid of by amputating both middle turbinals.

Dr. JANSEN (Berlin) drew attention to the opening of the antrum through the introitus narium, a method he had employed in 150 cases with success. He held that as soon as pus retention in a sinus was diagnosed, or severe suppuration found, then operation should be undertaken. The same held good for asthma in frontal sinusitis. Hajek had produced a new disease-picture—post-operative meningitis. But the speaker held that meningitis could be avoided easily in frontal sinus operations, at all events much more easily than in intra-nasal methods. Further, he called attention to the value of removing the ethmoid completely. He had employed the method of opening up all the sinuses through one opening, as in his operation through the antrum. In his twenty years as operator he had performed 900 frontal sinus operations.

Dr. LÁNG (Budapest): Of three cases of ulcerative frontal sinusitis, one died with cerebral symptoms and two were cured by radical operation.

Dr. RÉTHI (Vienna) was not quite contented with the result of the Caldwell-Luc operation. He related a series of cases in which the continuance of suppuration was finally cured by the formation of a large opening in the nasal wall of the antrum. With reference to the frontal sinus, threatening symptoms being absent, he was conservative in his tendencies.

Dr. UCHERMANN (Christiania) agreed with Dr. Hajek entirely, save that he was even more conservative.

Dr. DUNDAS GRANT (London) recommended bougies of different sizes for the naso-frontal duct to be used after preliminary removal of polypi, granulations, etc. Headaches were often relieved by the patient practising negative "Valsalva." He regarded Killian's as the best radical operation. He had recently encountered two fatal cases after the operation, in both of which meningitis was the cause of death, the infection reaching the meninges in the one case through the veins, in the other through the lymphatics.

Dr. FINDER (Berlin) advised Sturmann's operation, as it had given him good results in some cases; it represented a happy combination of the very thorough Denker method, and the simple opening of the inferior meatus of the nose.

Dr. MARSCHNICK (Vienna) reported two cases of brain abscess from Chiari's clinique, one with meningitis after Killian's operation. The *post-mortem*, however, showed that the operation had not been responsible.

Dr. OXODI said that it was desirable that all cases of post-operative meningitis should be published. All cases also which came to *post-mortem* should be exactly investigated in order that our knowledge of the pathogenesis of intra-cranial and cerebral complications might be perfected.

Dr. KILLIAN (Freiburg) agreed that acute and many chronic cases could be treated by simple measures. It was more difficult to bring about lasting cure in a chronic case. The first thing to be done was to make a thorough examination of all the sinuses of both sides, aided by radiography. At the same time the patient's general condition should receive attention. In the absence of fever, pain, swelling and other serious symptoms recourse might be had to purely conservative or minor surgical measures, whether extra-nasal or intra-nasal. By so doing a limited number of cases would be permanently cured. This applied to the antrum more than to the frontal and other sinuses. Often improvement was all that could be obtained. Other cases would not be perceptibly influenced. Finally, there were also a certain number which became worse either locally or generally. After endless lavage and suction, and after many trivial but repeated intra-nasal manipulations and operations, patients became nervous. There were limits, in other words, to the conservative methods of treatment. If the patient's trouble persisted it gradually constrained us to more energetic measures. When we had to do chiefly with disturbances of secretion then we might entertain some scruples before proceeding with radical measures. Timid specialists were helpless in the face of such scruples. They could come to no great resolutions; and the lavages and aspiratings would continue as long as the patient stood firm and his patience, strengthened perhaps by fears of an operation, held out. In casting up the probabilities in a case in which the symptoms consisted for the most part of secretion from the diseased sinuses, it depended upon whether the flow was constant or intermittent, moderate or abundant, chiefly purulent or chiefly mucous, and what sinus or sinuses were affected. Slight cases of this kind could be left to themselves. If the malady was rather more troublesome then we would most readily have recourse to a radical operation if it was the maxillary antrum that was diseased, either alone or chiefly. As things were nowadays such an operation as the Caldwell-Luc, under local anæsthesia, was neither severe nor dangerous. Indeed, moderately diseased antra would get well if a sufficiently large opening was made into the nose. The same was true of the sphenoidal sinus. In the case of the ethmoidal and frontal sinuses, then the surgeon would the more readily decide to adopt the speaker's operation the better command he had of the methods, and the more he had practised them. The number of cures resulting from the Killian operation was already more than could be numbered. What was the meaning of the mishaps which had resulted from this operation? The easiest way to avoid misfortunes was to guard against errors of technique. His methods could not be learned from a book. After anatomical studies of many preparations and operations on the cadaver, beginnings should only be made under experienced guidance. A whole series of fatalities were due to intra-cranial lesions which were in existence prior to the operation, and had given rise to symptoms to which too little attention had been paid. It

was to be hoped that we would now learn to interfere with promptitude and skill the moment the critical situation became clear. There remained a number of fatalities which were the result of operations blamelessly carried out. Here most assistance would be got from the delicacy of our clinical examinations and the experiences obtained from accurate *post-mortem* investigation. Operation should not be resorted to when an acute was superadded upon a chronic affection; nor should it be resorted to when acute irritation had been induced by intra-nasal interference. If, under these conditions, operation was unavoidable, then primary suturing of the external skin wound should be omitted. Primary suture should be restricted to cases of simple mucous secretion or mild suppuration. By the use of secondary suturing erysipelas and osteomyelitis could be avoided. Packing of the wound should be done loosely, and the tampons should be removed after syringing with weak solution of hydrogen peroxide, the day after operation if possible, in order to prevent retention of the secretions. Diseased antra, especially if their secretion was virulent, should be operated on radically a sufficient time before the frontal sinus operation; or if at the same sitting then before the frontal sinus is dealt with. Above all, we should be careful not to interfere with that part of the middle turbinal where the olfactory nerve branches were distributed, since these branches were surrounded with lymphatic spaces directly continuous with the subarachnoid space. If pathogenic organisms once penetrated the olfactory lymphatic spaces then rapidly fatal meningitis was as good as inevitable. Patients suffering from other serious diseases, such as chronic nephritis, diabetes, etc., should be left alone. In persistent post-operative neuralgia the supra-orbital nerve should be removed. Neurasthenic troubles necessitated a more prolonged general treatment.

Dr. BOWIACH (Charkow) preferred conservative measures. In antral cases he curetted the antrum by means of curved curettes through the nasal opening, and also through the alveolar opening.

(To be continued.)

Abstracts.

PHARYNX.

Lautmann (Paris).—On Anæsthesia for the Removal of Adenoids. "Zeitschr. f. Laryngol.," vol. iii, Part IV.

The writer discusses at some length the relative advantages of performing the operation without an anæsthetic, and of the use of either local or general anæsthesia. For children of not more than four years of age, who can be easily kept still, it is preferable to work without an anæsthetic. Beyond this age an anæsthetic has the great advantage of preventing the struggling, which is probably the most common cause of incomplete operation. After a trial of Ruprecht's method of local anæsthesia for adenotomy it was decided to reserve it for adults, in whom it is certainly less dangerous than general anæsthesia and renders thorough operation more certain. For all other cases the author prefers general anæsthesia by ethyl chloride, administered by Camus' apparatus, to any other method. He has used it in some 200 cases with satisfactory results in all.

The apparatus permits of complete narcosis with the use of very small quantities of the drug. For children of about four years of age 1 grm. is enough, for older children 2 grm., a quantity which will give a sufficiently deep anesthesia to allow of the careful and complete removal of tonsils and adenoids in patients of twelve to fourteen years of age. For adults 3 grm. are required. None of the patients have complained of headache after operation; one highly nervous boy only stated that he had suffered for the rest of the day from attacks of giddiness. Hitherto no death has been recorded as a result of anesthesia with Camus' apparatus.

Thomas Guthrie.

Grossard and Kaufmann.—The Complications of Adenoidectomy. "Bull. et Mém. de la Soc. Franç. d'Oto-Rhino-Laryngol.," vol. xxvii, Part I, 1911, p. 5.

This long and interesting report is founded upon communications collected from various otologists in France, England, Brussels, Algiers, etc. It is divided into parts dealing with—(1) accidents from incomplete diagnosis, (2) hemorrhage, (3) traumatic accidents, (4) infections, (5) nervous complications, (6) various accidents, and the following gives a short abstract thereof.

(1) *Accidents from Incomplete Diagnosis.*—Comprises aberrant arteries, large Eustachian cushions, prominent atlas, gummata, and tuberculous vegetations.

(2) *Hæmorrhage* may be primary or secondary: due to hæmophilia, anemia, exophthalmic goitre, valvular disease, leukemia, menstrual, arterio-sclerosis, or following turgescence from the use of such anesthetics as ethyl bromide. Local causes are arterial anomalies and incomplete operation. Secondary are more dangerous than primary hæmorrhages. Instances of arterial anomalies are quoted from Piaget, Schmiegallow, StClair Thomson, and Macleod Yearsley. Aboulker furnishes cases due to injury of the vomer, and nephritis, Chavasse one from unsuspected scarlet fever. The treatment of hæmorrhage may be by ice, rest, hæmostatic powders, hot water, hydrogen peroxide, artificial serum, tamponing of the naso-pharynx, cocaine and adrenalin. In secondary bleeding the authors consider infections are most commonly the cause, and that forceps are more likely than curettes to be followed by hæmorrhage.

(3) *Traumatic accidents* are more rare. Avulsion of teeth, injury to vomer, Eustachian tubes, soft palate and pharynx. Cases are quoted. Adhesions may occur later: otitis may supervene.

(4) *Infections* may occur unless the operation is done under aseptic precautions, and preventive measures are described. Pyorrhea and dental caries are noted as causes. Brindel is quoted regarding a case who walked about the streets after operation, contracted a serious infectious amygdalitis, ending with detachment of the retina. Dan McKenzie has noted slight fever after operations for adenoids. The infections that may occur are acute otitis, suppurative otitis, pharyngitis, adenitis, pneumonia, bronchitis, acute septicæmia, fetid bronchitis, and angina. Cases bearing upon these causes are quoted from Bêco, Cornet, Delsaux, Macleod Yearsley, Koenig, Aka, and Glover.

(5) *Nervous complications* comprise spasm of the larynx (Délié), hysteria, epilepsy, chorea, shock, mental alienation (Dupré).

(6) *Various Accidents.*—Breaking of the curette (Macleod Yearsley, Holmes, Garlick, Chaveaux, Castex). Torticollis (Ferrerri, Moure, Boulai, Siefert, and others). Cervical pain (especially after operation in Rose's

position). Inspiration of portions of growth into the respiratory passages (Bar). Collapse. Late syncope (Chaveaux). Paralysis of the soft palate (Robaud). Phlebitis of the superficial veins of the face (Moure, Wolff). Passage of an adenoid fragment into the Eustachian tube (Kronenberg). Rheumatism (Broeckaert, Gallois and Parrel). Tuberculous meningitis (Mahu, Koenig). Acute meningitis (Jacques). Traumatic scarlatina (Bergé, Delsaux, and others) receives considerable attention. Purpura (Boulai). Chancre (Fournier). Accidents due to anaesthesia include deaths from chloroform, ether, and bromide of ethyl (Suarez and Mendoza, Menier, and others).

The report is a valuable contribution to the literature of the adenoid operation.

Macleod Yearsley.

Gill, Richard.—**Anæsthesia in Post-pharyngeal Abscess.** "Proc. Roy. Soc. Med." (Anæsthetic Section), March, 1911.

This communication refers to the case of a child, aged three, who was supposed to have "adenoids." Chloroform was given, but there was considerable difficulty in respiration. When the mouth was opened it was seen that the soft palate was pushed forward by a swelling, and the breathing became further obstructed. When the abscess was opened Mr. Gill grasped the child by the legs and inverted it so as to allow the pus to drain by gravitation. Mr. H. Bellamy Gardner was of opinion that in such cases a general anæsthetic should not be administered.

J. S. Fraser.

Macdonald, A. G.—**A Record of Ninety Diphtheria Carriers.** "Lancet," March 25, 1911.

At the end of a very interesting paper the author thus summarises his work: (1) Carriers are found at all ages and of either sex. (2) The previous carrier period cannot be ascertained but may in some cases be inferred. (3) Nor can it be said in many cases that one case was derived from another. (4) The presence or absence of an obvious pathological condition is no criterion of the fact of a carrier, of the length of carrier life, or of virulence. (5) The length of carrier life seems to have no effect on virulence. (6) Carriers are found amongst those most intimately associated with other carriers or cases. (7) The control of diphtheria depends (assuming control of the case) on the control of the carrier. (8) The carrier should be notified as a case of diphtheria, no matter of what age or sex, and due quarantine and observation should be maintained until satisfactory demonstration of the disappearance of the *Bacillus diphtheriæ*. (9) As everything points to the conclusion that the bacillus is essentially a human parasite, a determined attack on the lines of thorough bacteriological investigation should have no difficulty in stamping out diphtheria altogether from the land. (10) Evidence points to the slow, inevitable, mechanical distribution of the disease which persists endemic in the undiscovered carriers. Epidemicity depends entirely upon the number and nature of the carriers.

Macleod Yearsley.

Cornet (Chalons-sur-Marne).—**Large Adenoma of the Superior Surface of the Soft Palate undergoing Epitheliomatous Degeneration.** "Ann. des Mal. de l'Oreille, du Larynx, du Nez, et du Pharynx," vol. xxxvi, Part I.

A woman, aged twenty-seven, presented herself at the author's clinic

with the following history: The day before, during a violent fit of coughing accompanied by nausea, a fleshy mass suddenly protruded into the mouth; the cough abated, and the mass returned into the throat, but since then she was continually troubled with nausea, associated each time with prolapse of the growth into the buccal cavity. Her health had previously been good, but for the past nine or ten months she had experienced some little difficulty in nasal respiration, and occasionally expectorated a little blood in the morning. Examination of the oro-pharynx revealed the presence of a large tumour which hung behind the free border of the velum. The growth, raspberry red in colour, was irregularly rounded, multi-lobed, with a cauliflower-like surface. Transversely it extended from the right posterior faucial pillar to midway between the uvula and the left posterior pillar, and in a vertical direction it dipped down to the base of the tongue; in consistence it was hard and did not bleed when touched. When nausea was induced the growth protruded from the naso-pharynx, and swinging from behind forwards was smartly driven into the mouth; during this movement it carried the palate with it. Digital examination showed the growth to be attached by its anterior surface to the right half of the palate. The author draws attention to the insidious course of the growth: it had attained the size of a small hen's egg without causing notable nasal obstruction; this depended upon its position rather than its size. Probably before prolapsing into the oro-pharynx the growth was more or less fixed behind the right choana, leaving the left side of the naso-pharynx free. Histologically the growth was an adenoma undergoing epitheliomatous degeneration. Adenomata usually develop at the expense of the anterior surface of the palate; in the present case the growth was implanted on the posterior surface. Removal was easily effected under cocaine anaesthesia. Having placed the patient in Rose's position the soft palate was tied up with a gauze thong; the tumour was then seized with an Eseat's fibroma forceps and firmly drawn forward by an assistant, after which, with the left index finger as a guide, the pedicle was divided with curved scissors; the patient made an excellent recovery. Full details of the histological examination of the neoplasm are recorded.

H. Clayton For.

NOSE.

Tunis, J. P. (Philadelphia).—Multiple Abscesses of the Nasal Submucosa in a Case of Leukæmia. "Amer. Journ. Med. Sci.," January, 1911.

The case reported was one of ten cases of leukemia in which the writer had the opportunity of examining the nasal cavities *post mortem*. It was the only one which showed the condition described. A man, aged forty-four, died after an illness lasting three weeks from acute lymphatic leukemia. Epistaxis, hæmorrhages from the gums, and swelling of the cervical glands were the prominent features of the disease. Portions of mucous membrane removed from the middle and inferior turbinals showed to the naked eye numerous punctate hæmorrhages, and microscopically much thickening with œdema and round-cell infiltration, and in places small abscesses with large numbers of streptococci in their border zone. It was estimated that there were at least one hundred of these abscesses

in the nasal mucous membrane. The occurrence of interstitial hæmorrhages in leukaemia is almost the rule, but their development into abscesses is rare.

Thomas Guthrie.

LARYNX.

Wilson, J. Gordon.—Some Points in the Comparative Anatomy of the Larynx in the Anthropeidea. "Annals of Otolaryngology and Rhinology," December, 1910, p. 951.

An interesting paper, the result of a study, macroscopic and microscopic, of the larynges of a Chinaman, an orang-outan, several *macacus* monkeys, and a marmoset. These organs the author compared with those of an adult and infant Caucasian, a young lion, the dog, cat, and horse. To be appreciated properly the paper should be read in the original. To one fact, however, prominence must be given: that in the larynx we have an organ whose recent phylogenetic history shows marked developmental progress, and whose present state is that of great variability, the latter fact suggesting developmental activity. The progress of the larynx is markedly forward, and it may be that we shall yet be able to demonstrate subtle anatomic differences comparable to the higher physiological functions in man.

Macleod Yearsley.

Shurly, B. R.—An Investigation of Post-operative Conditions Five to Ten Years after Intubation. "Ann. of Otol., Rhinol., and Laryngol.," vol. xix, No. 4, p. 1063.

The author deals in detail with thirty cases, all intubated for laryngeal diphtheria. The conclusions offered are: (1) Intubation in laryngeal diphtheria is required more frequently where marked tonsillar hypertrophy exists. (2) Pathological adenoids and tonsils are prominent predisposing factors in diphtheritic infections of the larynx. (3) No deleterious effects of antitoxin were noted. (4) Laryngeal paralysis is extremely rare after intubation. (5) Little attention is often given by the physician or patient to nasal obstruction until serious damage results to the general health. (6) Numerous pathological conditions of the upper respiratory tract may exist without symptoms or annoyance. (7) Scar-tissue was observed in two cases, insignificant and producing no modification of function. (8) No case of laryngeal paralysis was found. (9) The pathological effects of diphtheria upon the tonsillar ring are numerous and aggravated. (10) Children developing laryngeal diphtheria show a marked tendency to other infections of childhood. (11) Chronic catarrh of the upper respiratory tract is usual after severe diphtheria.

Macleod Yearsley.

Claoné, R. (Bordeaux).—Calcined Magnesia in the Treatment of Laryngeal Papillomata of Children. "Ann. des Mal. de l'Oreille, du Larynx, du Nez, et du Pharynx," vol. xxxvi, Part I.

A child, aged six, was completely aphonic. No respiratory trouble. The thorax was deformed and the patient was markedly anæmic. Multiple papillomata occupied the vocal cords, ventricular bands, and aryepiglottic folds. The growths were removed under chloroform anaesthesia by the direct method. Recurrence took place after a month. A course of arsenic, and subsequently one of iodide, was tried without

result. Operative treatment was again carried out, only to be followed by another relapse. Aware of the happy results experienced by Dr. Frèche in the treatment of cutaneous papillomata by the internal administration of calcined magnesia, the author was induced to try the method: 5 grm. were administered daily; at the end of a fortnight there was a manifest improvement. Treatment was suspended for fourteen days, after which time a dose of 0.50 gr. was continued for four months. The papillomata gradually disappeared; the largest underwent thinning of their pedicles, withered, and were expectorated. Details of a second case, attended with a like result, are recorded. A third case, not published, was that of a child suffering from laryngeal and tracheal papillomata, under the care of M. Sargnon, to whom it had been sent for laryngostomy. Before operating on the larynx M. Sargnon endeavoured to clear the trachea; removal was carried out endoscopically twice a week for some months, but recurrence always ensued. At the writer's suggestion calcined magnesia was given internally and the growths were dusted with the same material. A very notable improvement resulted.

The author remarks that though the results of treatment in these cases may have been coincidental, he is inclined to take the contrary view, the more so as in veterinary practice, where papillomata are so common in the buccal cavity of the dog, calcined magnesia is the remedy.

H. Clayton Fox.

EAR.

Shambaugh, G. E.—*The Physiology of Tone-perception.* "Ann. of Otol., Rhinol., and Laryngol.," vol. xix, No. 4, p. 983.

An able paper in support of the author's contention that the membrana tectoria is the chief factor in tone-perception. His interest in the question was aroused by certain anatomical conditions which convinced him that Helmholtz's basilar membrane theory is untenable. The study of the problem of tone-perception should be based upon anatomical investigation, since it is one which can be approached only indirectly and does not permit of actual demonstration. Theories have been worked out hitherto independent largely of anatomical considerations. Shambaugh points out the close structural analogies between the macula acustica of the utricle and saccule with its otolith membrane, the crista acustica of the ampullæ with its copula, and the organ of Corti of the cochlea with its membrana tectoria. The close structural analogy of these end-organs suggests that they react to stimuli in much the same manner. Helmholtz's theory is reviewed and the following anatomical objections indicated: (1) The fact that the fibres of the membrana basilaris are interwoven like those of a flat tendon. (2) The fibres are so embedded between cellular layers above and below that it is not easy to see how they can be acted upon by impulses in the labyrinthine fluids. (3) The fibres become thicker and less tense towards the lower end of the basal coil, instead of thinner and tenser. (4) A blood-vessel is attached to the under-surface of the basilar membrane throughout its length, which makes any response to impulse the same at all times impossible. This alone is sufficient to render the theory untenable. On the other hand, the hair-cells are normally in actual contact with the membrana tectoria.

The latter consists of an immense number of delicate fibrillæ imbedded in a gelatinous matrix, which makes it eminently suitable for response to impulses passing through the endo-lymph. It varies in size, being smaller toward the lower end of the basal coil and becoming gradually larger toward the apex of the cochlea. As regards the probable action of the membrana tectoria three possible modes suggest themselves, two of which fail to account for the existence of "tone-islands" or for the occurrence of circumscribed degenerations in the organ of Corti as a result of over-stimulation by certain tones. The third suggestion is that the membrane responds to sound-waves by circumscribed areas being thrown into vibration in different parts of the cochlea for tones of varying pitch. This fulfils all necessities as regards tone-analysis, "tone-islands," etc. The following conclusions, therefore, seem quite clear: (1) That the tectorial membrane is the structure in the cochlea which, by responding to the impulse of sound-waves in the endo-lymph, brings about a stimulation of the hair-cells of Corti's organ. (2) That circumscribed areas in this membrane respond in different parts of the cochlea for tones of varying pitch, the high tones in the basal coil, the lower tones in the upper coils of the cochlea.

The paper really requires reading in its entirety.

Macleod Yearsley.

Guggenheim, L. K.—**The Anatomic Explanation of Vestibular Nystagmus.** "Ann. of Otol., Rhinol., and Laryngol.," vol. xix, No. 4, p. 1024.

The author describes a series of photographs of specimens showing the relations of the vestibular apparatus and the endings of the vestibular nerve in the labyrinth. The paper is a useful summary of the question, but contains nothing new.

Macleod Yearsley.

Froeschels.—**Review of Recent Literature on Otosclerosis.** "Zentralbl. f. Ohrenheilk.," March, 1911.

The recent literature has had the effect in the main of demonstrating that many of the previously accepted views on otosclerosis must be given up.

Clinical.—The disease is generally one of young people, not infrequently is a family affection, and especially attacks females. Its symptoms are increasing deafness and nearly without exception loud subjective noises. Generally both ears are affected but rarely at the same time. No evidence in typical cases of catarrhal changes; frequently there is a reddish reflex in the lower part of the membrane. No evidence of Eustachian catarrh. Rinne negative, lengthened bone-perception, positive Gellé, restriction of lower tone-limit. Weber to the deafer side. Later the tests alter to those of labyrinth type, with giddiness.

Pathological.—Bony fixation of the footplate of the stapes: in the majority of cases investigated, bony new formations on the promontory, and according to certain authors, also in the rest of the petrous. Nerve-degenerations have frequently been observed. Politzer considers the new bone as sclerosed, Siebenmann as spongy. Habermann views the tympanic mucosa as the starting-point of the proliferating process, while Politzer, Siebenmann, and many others consider the mucous membrane as healthy.

In many cases of otosclerosis the condition remains stationary while the method of life is hygienic, and gets worse with all forms of excess and

frequently during the puerperium. Therapeutics are almost helpless. Paracusis is often a symptom.

Etiology.—This remains absolutely undiscovered. In some countries the distinction between otosclerosis and the catarrhal processes is still not clearly defined. Lucæ, Habermann, and Denker do not agree with this separation. Politzer, Siebenmann and others, on the other hand, consider the process as primarily in the bone, quite independently of the mucosa, but later affecting it. Alexander, Bruehl, and Siebenmann believe that the condition is congenitally determined. Habermann considers syphilis an important element in the causation. Hammerschlag illustrates the hereditary factor by the case of two families in which deaf-mutes and otosclerotics occurred, and advances the following points: that the degenerative processes in nerve-endings and nerves which occur in congenital deafness are probably exactly the same as those of otosclerosis; that the bone changes of otosclerosis are also found in many cases of congenital deafness; that families occur in which hereditary deafness and otosclerosis are associated. He seeks to connect the pure nerve-deafnesses with otosclerosis and the hereditary nerve-degenerations. Manasse, in fifteen cases of otosclerosis, found typical bone-formation in only three, while all showed degenerative changes in nerve. Bruehl¹ holds that the following classes must be distinguished, viz. labyrinth atrophy without bone changes, labyrinth atrophy with rarefaction of bone or fixation of the stapes, beginning as a nerve-deafness; isolated fixation of the stapes, appearing as a middle-ear deafness; fixation of the stapes with labyrinthine deafness, showing mixed symptoms. The results of the Wassermann reaction in otosclerotics have differed widely with different observers.

Froeschels has devised two tests of rather doubtful value depending on a diminution which is said to occur in the sensibility of the external meatus in otosclerotics.

Ernest West.

Alexander, Prof. G. (translation by G. L. Richards).—On the Possible Effect upon the Auditory Labyrinth of the Ehrlich-Hata Remedy in the Treatment of Syphilis. "Boston Med. and Surg. Journ.," March 9, 1911, p. 33).

The author has been collecting material for a study of syphilitic diseases of the ear for six years, and, referring to three cases recently reported by Professor Finger, he points out that it is most necessary to determine early whether in some cases we have not to do with the poisonous action of arsenobenzol on the auditory nerve. He was asked by Finger whether he had seen cases similar to those occurring after the injection of "605" before the introduction of that remedy. To this inquiry Alexander replies from a study of his material, which consists of sixty-eight cases, and he gives it as his opinion that Finger's cases must be considered as having an aetiological relation to the arsenobenzol. He then gives in detail one case (out of seventy-two treated with "606") in which the ear condition due to the disease was made much worse by the injection, given at a time when the left auditory nerve was acutely diseased. In Alexander's opinion existing disease of the vestibular nerve presented a *point of weakened resistance to the action of the arsenobenzol*. He thinks, from experiments made with arsacetin, that there is danger of making the condition worse in every case in which at the time of the arsenobenzol injection there is already present disease of the auditory nerve, whether

¹ See JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY, June, 1911, p. 294.

syphilitic or otherwise, and he cites Ehrlich's production, by injecting white mice with arsacetin, a phenomena similar to those of the Japanese dancing mouse, and due to degeneration of the central fibres of the vestibular nerve. Finally, Alexander, speaking as an otologist, recommends caution in using "606" in cases of acute syphilitic disease of the auditory nerve, and especially in cases of recent syphilis with acute or chronic disease of the auditory nerve, syphilitic or not. Cases of chronic syphilitic affection of the nerve and of chronic labyrinthine dizziness, on the other hand, appear to benefit by the injection.

Macleod Yearsley.

Reik, H. O.—The Effect of Tobacco on the Ear and Upper Respiratory Tract. "Boston Med. and Surg. Journ.," June 23, 1910.

The author begins with a strong indictment of the grossly exaggerated and sometimes even false statements often made as to the evil effects of tobacco and alcohol, and remarks upon the remarkable scarcity of trustworthy literature upon the subject of tobacco and the ear. Enters into the preparation of tobacco and the analysis of tobacco smoke, the weight of evidence going to show that the volume of carbon monoxide contained in tobacco smoke is much more dangerous than the small trace to be found of nicotine.

No characteristic lesion of the throat or nose attributable to tobacco has yet been described, nor is there any evidence that smoking causes malignant disease of the throat.

The author can find only one definite case of anosmia reported as due to tobacco, and he considers Wyatt Wingrave's testimony as to tobacco deafness incomplete and inconclusive. Other literature on this point is reviewed.

A good bibliography is appended.

Macleod Yearsley.

MISCELLANEOUS.

Arrowsmith, H.—Certain Aspects of Rhino-laryngology and their Relation to General Medicine. "New York Med. Journ.," December 17, 1910, p. 1209.

The author discusses the treatment of impacted foreign bodies, Vincent's angina, and the faucial tonsils, and makes the following propositions concerning the latter: (1) Pure hypertrophy of the faucial tonsil is essentially a phenomenon of early life, and is rather protective than pathological. (2) Its cause is very often disease of the pharyngeal tonsil. (3) That a moderate pure hypertrophy, up to the age of puberty, should be respected. (4) When hypertrophy demands interference, the only justifiable operation is amygdalotomy, and not enucleation. (5) Enucleation is justified when disturbances in the tonsillar structure are the source of glandular involvements and a menace to the general health. (6) After puberty, pathological processes in the tonsil demand radical surgical measures.

Macleod Yearsley.

(1) **Bryant, W. Sohler.—Reflexes and Reflex Neuroses from the Upper Air-tract (including the Nose and Pharynx).**

(2) **Page, J. R. Reflex Disturbances Referable to the Ear.** "Boston Med. and Surg. Journ.," February 2, 1911, pp. 144-149.

The two articles form part of a series of papers upon reflex disturbances.

Bryant states that more than 247 different reflexes and reflex neurotic symptoms have been recorded as emanating from some part of the upper air-tract, due to either local inflammatory or structural conditions, and that each stimulation may travel over at least two distinct nerve routes. As a conservative estimate he computes that 9880 different manifestations may occur from the upper air-tract (!). The reflex neuroses in general may be divided into two large groups—simple and complex. The former includes all forms of exaggerated reaction to normal or non-pathological stimulation, the distinguishing characteristic being the hyperæsthetic conditions of the part stimulated, or the abnormally intense reaction to a normal stimulus. These complex neuroses include all those symptoms produced by abnormal stimuli, by hyperæsthesia of the nerve-endings, and by disease in the nerve-tract and nerve-centres through which the stimulation passes. Simple reflex neuroses are caused by repeated or prolonged stimulation carried to a point of nervous exhaustion, which produces hyperæsthesia. Complex reflex neuroses depend upon structural and peripheral changes, which cause an abnormal degree of nerve stimulation.

Bryant considers the human nose and its nerve supply to be in a state of degeneration, and that to this is to be attributed its extraordinary susceptibility to pathological reflex action. A long list is given of reflexes and reflex symptoms arising from the pharynx.

In the second paper Page refers to ear cough, neuralgias and herpes, and other reflex phenomena associated with external, middle and internal ear conditions, without, however, adding to the knowledge already possessed by otologists.

Macleod Yearesley.

REVIEW.

Diseases of the Nose, Throat and Ear—Medical and Surgical. By WILLIAM LINCOLN BALLENGER, M.D. Third edition, revised and enlarged (506 engravings and 22 plates). London: Henry Kimpton. Glasgow: Alexander Stenhouse, 1911. 28s. net.

This is the third edition of Ballenger's imposing and original volume, and shows some amount of revision, although certain blemishes, noted in former editions, still remain. Possibly with the view to preventing an already large volume from becoming too unwieldy, enlargement has taken place in some sections at the expense of others. Thus, the pages upon diseases of the nose and accessory sinuses and those upon the ear have increased by seventeen and thirty-seven respectively, whilst the pharynx and fauces and the larynx have been curtailed by thirty-one and ten.

The descriptions of operations are good and, for the most part, clear, and more justice is done to other workers than in previous editions, although the value of reference to original papers is still unrecognised by the author. Many of the operations described are those devised by Ballenger himself, whose originality and fertility in inventing instruments is remarkable. Full details are given for removing the ethmoid cells *en masse*, and, despite the somewhat naïve remark that it was originally devised "for the purpose of obtaining specimens for examina-

tion," one cannot but feel that, in certain cases, it might prove an operation of value.

Upon the question of vaccine therapy in nasal and otitic suppurations the author does not say very much, and is (rightly) cautious in his remarks.

It is noted that Quinlan's forceps are now referred to (p. 342) in discussing the clearing of the epipharyngeal space in adenoid operations.

The whole surgery of the nose and naso-pharynx is very adequately treated, and offers quite a wealth of operative procedures, the greater number of which are very well illustrated.

In the section dealing with the pharynx and fauces much space is devoted to the tonsils, and numerous operations are described. Among them we note one attributed to Sluder, which appears to be identical with that recently described by Whillis and Pybus. The remarks upon lingual varix need revision, but less so than does the description of the laryngoscopic picture of malignant neoplasm of the larynx (p. 554). This was pointed out in a former review in this JOURNAL, and it is remarkable that the reference to Semon's law remains here, and that, in the section devoted to paralysis of the recurrent laryngeal nerve (p. 514), Semon's name is not even mentioned.

One would think the bringing out of a third edition would have afforded the author opportunity of profiting by the criticism of his reviewers, but he appears to have taken only a partial advantage of this opportunity. He has corrected the spelling of Ruault's name, but Siebenmann still appears as Siebermann, and the need of revision in such places as have just been noted is very patent. It is a pity, too, that the valuable work of British otologists upon labyrinth operations should have received so little notice.

The discussion of diseases of the ear is adequate but not exhaustive. The author has modified the so-called Heath operation, and we note with approbation that he has personally had rare occasion to use the grafting operation "as his cases usually become covered with epidermis in as short a time as is claimed by Billance after the use of Thiersch grafts." This is probably the experience of most otologists at the present day. It is to be noted that ossiculectomy, in the author's opinion, gives a very small percentage of cures.

An excellent section deals with the surgery of the facial nerve.

The general arrangement and appearance of the book are excellent, and the plates, especially the coloured ones, form a most valuable addition to the work.

Macleod Yearsley.

BOOK RECEIVED.

Handbuch der speciellen Chirurgie des Ohres und der oberen Luftwege.

By *Drs. L. Katz, H. Preysing, and F. Blumenfeld.* With coloured plates. 1 B1. Liefer: 4 and 5. Würzburg: Curt Kabitsch (A. Stuber's Verlag), 1911.

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THE INTER-RELATIONSHIP OF THE VESTIBULAR APPARATUS AND THE CEREBELLUM.¹

BY DR. ROBERT BÁRÁNY (Vienna).

Abstract translation by Mr. A. R. TWEEDIE.

[A MOST interesting and important paper read at a meeting of the Swedish Otological Society in Stockholm, February 27, 1911, in which the author gives an account of the various steps that led up to the elaboration of his co-ordination tests. Although as yet admittedly in part dependent on hypothesis, Bárány prefaced his remarks by stating that the results already obtained demanded very serious recognition.]

In 1907, when he published his book on the physiology and pathology of the semi-circular canals, the author said he had no idea of the interdependence of these structures and the cerebellum. He was, of course, aware of the generalisations as to the small brain being the seat of the control of equilibration and the centre for orientation, but such vague statements as these were to him unsatisfactory and therefore avoided in his book. At that time the reflex phenomena of the vestibule were apparently completely explicable from the already recognised communications of the vestibular nerve, apart from the cerebellum, and could be attributed to the fact that this nerve, after passing through its ganglion,

¹ *Monatsschr. f. Otorhinolaryng.*, year 45, No. 5.

was traceable to Deiter's nucleus, the cells of which communicated, *via* the posterior longitudinal bundle, with the axons of the cells in the oculo-motor and abducens nuclei, and that thus the nystagmus was brought about. Other axons from the cells of Deiter's nucleus communicated with the cells of the spinal cord by the vestibulo-spinal path, and it was to this connection, as he then thought, that the disturbances of equilibration which accompanied the induced nystagmus were to be referred. So that then he had not considered the cerebellum itself played a part in these phenomena. However, his attention had been directed to the investigation of Marburg and Bing on the artificial destruction of the cerebellar tracts in dogs and the ataxia thus produced, and thereby he was led into the following train of thought:—A normal person in whom a left-directed rotatory nystagmus was induced tended to fall to the right; if the head were turned 90 degrees to the left he would fall forwards; and if it were turned 90 degrees to the right he fell backwards. How, then, was this completely different stimulus to the skeletal musculature to be explained? It was, of course, possible that an additional stimulus might have been given to the vestibular apparatus itself by such movement of the head; as, however, the same conditions obtained when the head was turned *before* the irrigation was commenced or when the body was turned *under* the head, he had been able at once to exclude this as a possible cause, and he was thus driven to refer these affections of equilibration to the sensibility of the muscles or joints of the neck and head—the proprioceptive system of Sherrington. The movement of the head *associated with* the vestibular stimulus must therefore produce this effect on the skeletal muscles. In what area of the brain did this association take place? Could it be in Deiter's nucleus? Now both the proprioceptive system and Deiter's nucleus had well recognised connections with the cerebellum. Such then might be a function of the small brain, and at this point some other ideas had occurred to him. He had noted, as indeed had other observers, the similarity between the ataxia of patients the subject of cerebellar disease and those in whom some vestibular affection existed, and further, that in most patients of both these groups there was spontaneous nystagmus, with this difference, that in cases of ataxia due to cerebellar lesions neither the nystagmus nor the position of the head bore any relation to the direction of the tendency to fall.

He therefore at once commenced an experimental investigation as to the reaction of cerebellar cases to irrigation of the meatus

A patient, with undoubted cerebellar ataxia, was found who could only stand with difficulty, and tended to fall spontaneously to the right and backwards. Irrigation of the right ear induced a typical vestibular nystagmus to the left—thus the peripheral vestibular apparatus and vestibular nerve were functional. The reaction on the left side was also similarly normal. However, whilst the author was able under this stimulus on the left side to influence the direction of falling in a typical manner—that is, by turning the head to the right the patient fell forwards, and so on—no such effect whatever could be obtained from irrigation of the right ear. He had therefore concluded that the tumour must be situated on the right side—an assumption which was later fully corroborated at the autopsy. Based on these observations he delivered a preliminary communication first at Budapest before the International Otolological Congress. During 1910 he had seen a large number of cases which he regarded as affections of the cerebellum, none of which, however, were either operated upon or examined *post mortem*; but at length he had the opportunity of examining an undoubted case in Eiselberg's clinic in which the question arose as to whether a tumour of the cerebellum were situated on the left or the right side. On both sides he was able to induce a typical caloric nystagmus, but only on one side could he elicit reaction movements in a "normal" manner. As irrigation of the left meatus resulted in more marked disturbance than similar treatment on the right side he had diagnosed a tumour of the left cerebellar hemisphere. At the operation, however, it was found to be situated on the right side. This caused him much perplexity, and forced him to the conclusion that he had not yet arrived at a proper solution of the problem.

In this dilemma he gained much assistance from the writings of Cajal, Bolk, Nothnagel, Pineles, and Mann as to the histological anatomy of the cerebellum and its connections. Further, he recalled the fact that in cases of abscess or tumour of the cerebellum it had been constantly noted that the arm on the ipsilateral side was ataxic, and he also remembered a certain test which he had elaborated some years ago and described, but which till now had not occupied his attention. When working with the oculist Sachs he had carried out Gräfe's pointing test on a case in which there was an irritation of the vestibule. (This test consists in making a patient look at some object and then point to it, having closed the eyes; in cases where a paresis of the eye muscles exists this is unable to be performed with any accuracy.) What now would be the result, he asked himself, if this were tried on a person in whom

a physiological nystagmus had been induced; and by experimenting he had found out that if there were a normal left-directed nystagmus a deviation to the right in pointing took place. This he had noted, but had then not sought to explain; now, however, he reflected that if disease of the middle lobe caused spontaneous falling, lesions of the hemispheres should produce spontaneous deviation in pointing, whilst if in cases where the middle lobe were diseased no tendency to fall occurred, in affections of the lateral lobes the normal deviation in the pointing test should be absent.

He had very soon afterwards had the opportunity of examining three cases of cerebellar abscess, all of which had inco-ordination, but owing to the co-existence of spontaneous nystagmus and the inability to detect reaction movements on most occasions on the sound side no dependable data could be gained from these. After examining many other cases without being able to obtain sufficiently definite conclusions, he at length found a case, previously operated upon for cerebellar abscess, and now completely healed, in whom the lack of response on the operated side and obvious reaction on the sound side was most marked.

Another patient, too, came under his notice, in whom no alteration was detected in the reaction movements of the upper extremities, but spontaneous disturbance of the equilibration was present, and by irrigation, which evoked normal nystagmus, the falling reaction was affected. He had diagnosed a lesion of the middle lobe, and a few days later a tuberculous tumour was found in this situation *post mortem* with another small focus in the right hemisphere.

Bárány was now so sure of his ground that he showed some of these cases at medical meetings in Vienna, and communicated his observations to the South-West German Neurological Society at Baden-Baden, and to the meeting of the British Medical Association in London, 1910. In this latter city he was enabled, owing to the courtesy of Sir Victor Horsley, to examine four cases operated on for cerebellar lesions, and completely healed. Three of these he was able to state had had some lesion of the left lateral lobe, since no reaction-movements on the left side occurred when at right-directed nystagmus was induced, whilst the reaction-movements of the right arm and the left arm towards the right were so obvious when an opposite-directed nystagmus was evoked, that no doubt could exist as to the lack of response on the left side. In the fourth patient the reaction-movements appeared quite normal, but on irrigating the right ear, although a typical nystagmus

resulted, there was no associated tendency to fall, whilst irrigation of the left ear afforded both a typical nystagmus and falling. He had thus concluded that the lesion must have been situated on the right side of the middle lobe, which, indeed, Sir Victor later stated, had been the site of a glioma he had removed. Another cured case of cerebellar abscess, operated on by Mr. West, also served to confirm the correctness of these observations.

During the autumn of 1910, in Vienna, further investigations all tended to corroborate the results of his previous research, with the addition that from one case it appeared that past lesions of cerebellum could not always be demonstrated, presumably because other areas could undertake the function of those which had been destroyed.

Further research also showed that isolated reaction movements of individual joints might occur, as could be demonstrated by fixing or resting the upper or forearms, etc.

Before leaving Vienna on this occasion he had diagnosed a tumour of the left cerebellar hemisphere, which had since been operated on and found to be a broken-down cystic glioma. The patient had, unfortunately, succumbed during the operation. This was the first case in which he had been able to definitely locate a cerebellar tumour before operation.

Bárány, in conclusion, referred to the demonstration given by Trendelenburg at the Physiological Congress in Vienna, 1910, of his method of localising various centres in the cerebrum by means of the application of cold. These methods he had himself been able to utilise on a case of a healed cerebellar abscess, where the brain-tissue was left covered in only by skin and dura. The application of an ethyl-chloride spray to this area elicited reaction-movements in the upper and lower extremities corresponding to those one would expect from the experiments and phenomena he had just described, and thus he felt he was able to assert with assurance that further investigation of similar cases on these lines would result in the accurate mapping out of the whole cerebellar cortex, and establish the functions of its various parts.

THE PATHOLOGY OF INFLAMMATORY DISEASES OF THE LABYRINTH.¹

BY DR. MAX GÖRKE (Breslau).

[Abstract translation by DAX McKENZIE.]

INFECTIVE labyrinthitis is, of course, generally secondary either to meningitis or to otitis media. It is true that cases of primary labyrinthitis have been reported, but it is probable that such cases are more apparent than real, and that they are due to abortive forms of meningitis passing on to infect the labyrinth by way of the aquæductus cochleæ, the communication between the subarachnoid spaces and the perilymphatic system of the labyrinth. Even the deafness of epidemic mumps has been referred to such a transitory attack of cerebro-spinal meningitis (Brieger).

Causal Disease.—Apart from epidemic cerebro-spinal meningitis, the labyrinth is seldom attacked from the cranial side; most cases of infective labyrinthitis are secondary to middle-ear suppuration.

With regard to the question whether acute or chronic middle-ear suppuration is the more dangerous to the labyrinth, the author's investigations have shown that, if we include tuberculosis and cholesteatomatous disease, the chronic is the more frequent precursor of labyrinth infection. For of all the varieties of middle-ear suppuration, tuberculosis is the most common cause of labyrinthitis, while cholesteatoma comes next. It should be noted that both these varieties lead to septic infection of the labyrinth. In the simple septic types of suppuration of the middle-ear spaces the infection of the labyrinth generally takes place during an acute exacerbation of the tympanic disease, and this is not infrequently excited by traumatism, such as the removal of polypi, curetting, etc. Notwithstanding the greater tendency of chronic middle-ear disease to attack the labyrinth, there is also, nevertheless, considerable danger of this complication arising in acute suppuration, especially in that form which accompanies scarlet fever.

Routes of Infection.—The labyrinth stands in more direct continuity with the meninges than with the middle ear, consequently meningitis is more prone to lead to labyrinthitis than is disease in the middle ear, the respective percentages being from 15 to 50 of the former and 1 of the latter.

¹ From *Archiv für Ohrenheilkunde*, Bd. lxxx, Heft. 1 und 2, p. 1.

In the meningeal variety, occurring in epidemic cerebro-spinal meningitis as a rule, the infection of the labyrinth spaces takes place by way of the internal auditory meatus or the aqueductus cochleæ, and the pathological changes vary according to the route selected. In the case of the aqueductus cochleæ, the labyrinth disease is found chiefly in the basal turn of the cochlea, while the vestibule escapes wholly or partially. When, on the other hand, the infection has passed along the nerve-canals, both cochlea and vestibule are equally diseased. This difference, readily determined in early cases, is naturally less marked when the disease has been protracted.

When the labyrinth is attacked from the tympanic side the pyogenic organisms must traverse anatomical barriers; in other words, contrasting with invasion from the meninges, the route they take is pathological. The favourite sites for such pathological breaches of the outer wall of the labyrinth are the fenestræ and the external semicircular canal.

The author found that the round window was penetrated more frequently than is generally supposed, and this he ascribes to the tendency for pus to stagnate and for granulations to form in its niche. Further, he did not find erosion of the external semicircular canal to be as common as it is held to be, and he reminds us of Kümmel's opinion that canalicular erosions, though undoubtedly frequent, do not often lead to infection of the labyrinth.

Considerable difference of opinion exists among different observers respecting the influence of the acute or chronic middle-ear disease upon the route selected by the infecting organisms. Some hold that the fenestræ are preferred in acute cases, while others believe that the fenestræ are preferred in chronic disease, and so on. From his own experience and reading all that the author is able to say is as follows: In tuberculous middle-ear disease there is no regularity. In simple suppuration of the antro-tympanic cavity the posterior parts of the middle ear, together with the wall of the aditus, prove to be the most vulnerable because of the tendency of pus to collect in this neighbourhood. Cholesteatoma readily leads to erosion of the external semicircular canal because of the confined space in the aditus. Other sites of invasion are rare. The most usual place is in the region of the fenestræ, and it is here that the breach should be sought for in acute labyrinthitis.

Apart from gross destruction of the outer walls, it is possible

for the labyrinth to become infected *via* the blood-vessels, although the existence of any anastomosis between the vessels of the middle ear and those of the labyrinth has been questioned.

There is a third method by which a labyrinth may become diseased in suppuration of the middle ear, namely, in the process variously known as *collateral* or *induced labyrinthitis*, *labyrinth irritation*, or *labyrinthitis serosa*, or *sero-fibrinosa*, *diffusa*. The author corroborates Nager's description of the condition. It seems to be essentially a collateral œdema of the labyrinth spaces characterised by an increase in the bulk of the labyrinth fluid contents and by the presence of albuminous coagula, and leading to characteristic changes in the situation of the membranous sacculles and walls. Induced labyrinthitis may exist without any obvious breach in the outer wall of the labyrinth, but in some of the reported cases the changes in the wall, usually in the region of the fenestræ, were so considerable that a breach must have been imminent. These changes consisted in infiltration, thickening, and partial disintegration of the membranes of the fenestræ, and they were accompanied by collections of pus-cells on the inner aspect of the fenestræ. Inflammatory reaction within the labyrinth similar to that due to middle-ear disease is seen in meningeal labyrinthitis when the infection has entered the peri-lymphatic spaces, but has not yet penetrated the endo-lymphatic spaces. At this stage the latter show albuminous coagula, fibrinous deposits, desquamation of epithelium, and displacements from increase in the fluids of the labyrinth, just as in the serous labyrinthitis collateral to middle-ear suppuration.

Multiple breaches in the labyrinth wall are not uncommon. They occur oftenest in tuberculous, cholesteatomatous, and scarlatinal otitis media. One or more of these infractions may be due to infection within the labyrinth breaking out again, and it is even possible to distinguish between the ports of entry and the ports of exit.

Histological Changes at the Breach.—At the fenestræ the soft structures become œdematous and are infiltrated with cells. In the foramen ovale the annular ligament may be seen to be studded with little ticks of pus. Displacement of the foot-plate of the stapes inward or outward is by no means rare, and when healing takes place the dislocation persists and may constitute the only evidence of the invasion that took place at this spot.

Almost all observers have noticed that the most powerful obstacle to the propagation of infection is not the bone but the

endosteum, that is, the internal periosteum of the capsule of the labyrinth, which, indeed, behaves just as periosteum does in similar circumstances elsewhere. Pus may be seen burrowing between the endosteum and the bone, stripping the one from the other without breaking into the membranous labyrinth.

The reaction of the soft tissues of the labyrinth takes the form of a plastic exudation, and is always present save at times in tuberculosis. As soon as the inflammation reaches the endosteum granulation-tissue forms on the outer surface of that membrane. These changes are most clearly seen in meningeal cases in which the labyrinth has become infected from the aqueductus cochleæ. Buds of granulation-tissue sprout up in the vicinity of the internal aperture of the aqueduct and in a short time become transformed into connective tissue, which has a marked tendency to undergo ossification—processes which may eventually lead to a complete closure of the aqueduct.

Extension of the Disease within the Labyrinth.—The protective mechanism just described suffices to preserve the rest of the labyrinth from the disease, and it appears in all cases save in the extremely sluggish forms of invasion, tuberculosis, for example, and in the fulminating varieties such as follow operative trauma of the wall of the labyrinth. In these cases the whole of the labyrinth is filled with purulent fluid, and there is little or no sign of local reaction.

Apart from trauma, general purulent labyrinthitis is very rare, and fortunately so, because the routes leading to the meninges remain open. Indeed, as a rule, the intra-labyrinthine defences are successful in limiting the disease, so much so that sometimes the shut-off spaces show no abnormality whatever. In most cases, however, "collateral" labyrinthitis is evident in the sequestered regions.

Ruttin has attributed the defensive processes in the labyrinth to the action of gravity confining the products of inflammation to the lowermost parts of the labyrinth, but, as the author points out, these inflammatory products are not composed simply of liquid pus, as freely moveable as "quicksilver in a Triton's conch." What is much more likely is that the fine labyrinth canals are soon filled up with granulation tissue which, as the meningeal cases show, turns into connective-tissue, with astonishing rapidity. Only in the very slow-going invasions with feeble reaction, as in tuberculosis, or in conditions where the destructive agencies continue their advance, as in cholesteatoma, or in the case of severe

infections which break down the walls at several points, is the limitation of the inflammatory focus inside the labyrinth imperfect.

Changes in the Shape of the Membranous Canals of the Labyrinth.

—The labyrinth spaces undergo alteration in shape as a result of (a) an increase in the fluids of the labyrinth; (b) the direct mechanical pressure exerted by collections of pus or fibro-plastic exudation. Edema sometimes distends the endolymphatic spaces at the expense of the perilymphatic spaces and sometimes *vice versa*. This alternation or variation is very difficult to account for. It may be that the occasional pathological closure of the aquæductus cochleæ is responsible for the difference. At all events the other explanation, that the difference is due to an excessive secretion from the stria vascularis, is one which cannot be proved. In one case, in which meningeal infection travelled along the nerve and in which the brunt of the disease fell equally upon all the spaces of the labyrinth, a decided displacement was noticed of the scala cochleæ as well as of the vestibular sacculæ—that is, of the whole endo-lymphatic system. In two other cases, on the other hand, in which the infection had passed through the aquæductus cochleæ, a collapse of Reissner's membrane leading to almost complete obliteration of the scala cochleæ was found, together with contraction of the sacculæ of the vestibule and great bulging of the membrane of the round window into the tympanum. That is to say, there were present in these cases all the signs of a decided rise in perilymphatic pressure.

Changes in the bone are of the usual two kind—proliferation and destruction.

We have already seen that *bony proliferation* is an early effect of the reactive processes in the endostem, and that it is present, more or less, in all save fulminating or extremely sluggish cases. The amount of proliferation varies from the earliest beginning of ossification to the complete filling up of all the spaces of the labyrinth with bone, as in a case of tuberculosis of the middle ear examined by the author.

The distribution of the new bone in the labyrinth seems to follow a kind of rule. In the cochlea, in conformity with the chief site of inflammation, it is the basal whorl that shows the greatest number of bony spicules. The semicircular canals, also, are often quite filled up with bone. But the vestibule, on the other hand, shows only a few proliferations, and obliteration of its spaces with fibrous tissue is much more common.

Destruction of the bone may occur as necrosis or in consequence of rarefying osteitis.

The occurrence of necrosis is postulated by vascular conditions. Though by no means uncommon it cannot occur unless the rich blood-supply of the internal ear from the internal auditory artery, the stylo-mastoid artery, the artery in the subarenate fossa, and the vessels of the external periosteum of the petrous is seriously interfered with, and this only occurs in the most intense varieties of inflammation. Lange has drawn attention to a special form of infarction of the labyrinth. In about one half of his cases he found a subarachnoid abscess situated at the fundus of the internal auditory meatus, where the fibres of the cochlear branch split up and spread out. In this funnel-shaped space a relatively large abscess had formed, and had led to destruction of all the vessels and nerves within its area. As a consequence necrosis of the labyrinth had ensued. The prime necessity for necrosis is therefore occlusion of the internal auditory artery; and, as this does not occur save as a consequence of labyrinthitis, Lange is correct when he says that the cause of necrosis and sequestration of the capsule of the labyrinth must be sought for first and foremost inside the labyrinth itself. Before the whole of the labyrinth can undergo necrosis, however, the other vessels must also be involved. This may occur as a consequence of rarefying osteitis secondary to severe middle-ear suppuration, the disease extending from the cells of the middle ear to the spongy bone which lies between the capsule of the labyrinth and the external cortex. The rarefying osteitis attacks also the outer layer of the capsule, and in this way the capsule is isolated and dies. The rarefying process may, moreover, originate in labyrinth suppuration just as readily as in middle-ear suppuration.

There are thus two factors necessary for the production of extensive necrosis of the labyrinth; first, suppuration of the labyrinth in its severest form destroying the soft tissues; and secondly, widespread rarefying osteitis, set up, like the labyrinthitis, by the suppuration in the middle ear and affecting the spongy bone of the petrous to begin with, and finally attacking the capsule of the labyrinth itself.

Effects of Labyrinth Inflammation.—There are three terminations possible. First is the *restitutio ad integrum*, the occurrence of which, save in the mildest forms of the so-called serous labyrinthitis, is almost inconceivable, since it is difficult to imagine how the less mild types in which fibrinous deposits and dilatation

of the spaces occur can recede and leave the delicate nerve-elements unimpaired.

Much more frequent is the second termination—that, namely, in which the inflammatory exudate is transformed into fibrous tissue and bone. (Cases illustrating this condition are detailed.) Even the severer varieties of infection of the labyrinth, with the formation of pus in its spaces, may undergo natural cure in this way. Indeed, it cannot be too often repeated that not even in the severest forms of labyrinthitis are these healing processes absent, and, what is still more important, that in the vast majority of cases their protective action is effective. We shall know more about the natural cure of purulent labyrinthitis when we have learned the causes that lead to the occurrence of the third possible ending—meningitis.

Meningitis: Routes of Infection.—In the front rank stands the internal auditory meatus, the mode of propagation through which has been demonstrated by Politzer. At the fundus of the meatus an abscess forms, separated from the healthy nerve by an inflammatory zone, which sets a limit, for a time at all events, to the inward spread of the disease. But when, as in the gravest cases, this zone is passed, then the last barrier is penetrated and the meninges lie defenceless before the invader. In like manner the aquæductus cochleæ or vestibuli may be selected as the avenue of approach to the endo-cranium.

In addition to these recognised routes there are others. In necrosis or in hyperacute inflammation of the soft parts of the labyrinth, as we have already seen, a not uncommon sequel thereto is an osteitis of the capsule. The infection from the diseased bone may reach to the surface of the petrous almost anywhere, but more especially at the vertical semi-circular canal, and then an extra-dural abscess forms, leading ultimately to meningitis.

As to the frequency with which meningitis is due to labyrinth disease many of the recorded statistics are open to serious criticism, since the following essentials in proving the connection between the two events are frequently overlooked. Anatomical proof must be forthcoming to show, first, that the labyrinth disease has been set up by tympanic and not by meningeal inflammation; secondly, that the intra-cranial complication is not the direct result of the middle-ear disease; while thirdly, the route from the labyrinth to the meninges must be clearly demonstrable.

The Question of Labyrinth Operation.—The exact value of operating on the labyrinth is not yet known to us, since we do not

know what the results are of leaving the labyrinthitis to run its own course. Many cases of spontaneous labyrinthitis get well of their own accord. This is true not only of mild circumscribed labyrinthitis, but also of the severer generalised forms of the disease. There is a second consideration to be discussed in estimating the value of operation, and that is that meningitis, for the prevention of which the labyrinth has been opened, may actually be induced by the operative manipulation disturbing adhesions, etc. That this is no fanciful objection the author has proved by the *post-mortem* examination of a case in which the accident had actually happened.

Even when the labyrinth is accidentally wounded during the performance of a mastoid operation, the effect may be so slight as to be negligible. This is particularly true when the breach is a small one, and is situated in the wall of one of the semicircular canals.

With regard to the contention that surgical opening of the labyrinth removes all disease and provides free drainage, the author's investigations lead him to the belief that it is illusory. In this connection it is instructive to compare the changes met with in diseased labyrinths which have been operated upon, and in those in which no operation has been performed. In the former the labyrinth spaces will be found filled with blood-clot and bony *débris*. For, in spite of the most assiduous curettage and removal of all visible pieces of bone, etc., small microscopic particles are left behind, which must, he thinks, render nugatory all efforts to provide free drainage. As a result, the free discharge of pus is hindered at the most important places, namely at the aqueductus cochleæ and at the internal meatus. Indeed, the only possible method of effecting the safe removal of all morbid material is by Neumann's method of ablation of the labyrinth. Finally, he adds that although in recent times labyrinth operations are less frequent than they used to be, he has not seen a single case of late in which he could say that the omission of the operation had led to the occurrence of meningitis.

SOCIETIES' PROCEEDINGS.

ROYAL SOCIETY OF MEDICINE—OTOLOGICAL SECTION.

May 19, 1911.

MR. ARTHUR H. CHEATLE, *President, in the Chair.*

DEAFNESS DUE TO OCCLUSION OF EUSTACHIAN TUBES BY SCAR-TISSUE.

BY DR. D. R. PATERSON.

Female, aged twenty-one, had suffered for about six years from congenital specific disease which affected the throat, leading to destruction of the soft palate and part of the hard, and to ulceration of the posterior and lateral walls of the pharynx. Various forms of anti-specific treatment had been tried from time to time, but the parts repeatedly broke down and led to loss of tissue, until eight months ago, under intramuscular injections of metallic mercury, healing was finally established. Since that time patient began to suffer from deafness, which has persisted with little or no alteration. There are no subjective sensations. Hearing: Right ear—conversational voice 10 in., whisper 1 in., left ear—conversational voice 2 ft., whisper 3 in. Bone-conduction is increased. The drums are flaccid in appearance. In the pharynx there is a large gap between the nose and throat, the posterior wall being formed by a dense white cicatrix. There is no appearance of Eustachian tubes.

Suggestions as to treatment were invited.

THE PRESIDENT (MR. ARTHUR CHEATLE) remarked that the question was, what could be done to improve the patient's hearing? Something ought certainly to be done. To attack it from the Eustachian orifice region was impossible in his opinion. Something must be done through the meatus. As a preliminary a hole should be made in the membrane to see if improvement took place, and if so further measures could be considered. As it was impossible to keep the opening in the membrana tympani patent, the question was, what operation should be done? Whether the membrane, the malleus, and the incus should be removed, or whether the incomplete mastoid operation would help?

DR. MILLIGAN said the condition was so beautifully healed that he would not interfere. In the case of a syphilitic lesion like this, where there had been so much trouble to get it to heal, he did not think it advisable to undertake any further operative interference.

MR. A. L. WHITEHEAD agreed with Dr. Milligan. He thought the deafness was not progressive, and the history was that it had been quiescent for some time. It was now satisfactorily healed. In many such cases there were other changes which vitiated the result of such an operation as the President suggested—*i. e.* even although there might be improvement in the middle ear it was unlikely that the hearing would get better. Some of these patients had other changes, and this girl had

marked interstitial keratitis, indicating that she was the subject of extensive congenital syphilis. His experience of that kind of case was limited to one, and in that disaster resulted. He succeeded in opening the naso-pharynx; he did not do the operation which the President suggested, but at a subsequent date the patient had acute naso-pharyngitis, followed by acute infection of the middle ear, meningitis, and death. Of course that might have come on apart from the operation, but it did not encourage one to interfere in such cases.

Mr. WEST remarked, speaking in ignorance of the practical results of the procedure mentioned, that if a preliminary opening in the membrane brought about immediate improvement in the hearing, it was worth while trying to make a permanent air vent in the tympanum. He would be inclined to do it through the mastoid, opening the antrum, and putting a tapering skin-graft into the antral opening, so as to get immediate healing of the damaged surface and a permanent fistula. Possibly that would give good results.

Mr. SYDNEY SCOTT asked what was the low limit of tone-perception in Dr. Paterson's case. If that limit were much raised he would not touch the patient, but if the lowest tones were audible the procedure suggested by Mr. West might be a feasible one.

Dr. WATSON-WILLIAMS agreed that the case should be left alone. His experience was that in these syphilitic cases satisfactory results were difficult to get when interfered with surgically.

Dr. PATERSON, in reply, said he ought to have mentioned that in the right ear a perforation existed for a short time, and during the time there was no improvement in hearing on that side. He had an open mind as to what was best to be done. The question was one that should be put clearly before the patient, telling her that possibly her hearing might be worse after the operation. When deafness first came on he tried to find out the position of the Eustachian tubes and had made incisions at several points, but without result. There was much destruction of tissue, a loss of the whole soft palate and much of the hard, and the whole lateral walls and the posterior wall were one large raw surface. It had now healed, and the resulting hole was much smaller than it was six or eight months ago. He considered it impossible to find the Eustachian tube from the naso-pharyngeal side.

A CASE OF ERYSIPELAS OF THE HEAD: INVASION OF THE RIGHT AUDITORY MEATUS, WHERE AN ABSCESS FORMED WITH EXTENSION BACKWARDS TO THE STERNO-MASTOID MUSCLE, AND INVASION OF THE WHOLE SHEATH OF THAT MUSCLE.

BY ARTHUR H. CHEATLE, F.R.C.S.

A dustman, aged forty-nine, had an attack of erysipelas, which began in the forehead along the line of his leather hat.

The right meatus became involved and an abscess formed on the posterior superior wall at the junction of the cartilaginous with the bony meatus. The abscess in the meatus discharged freely, and after fourteen days a swelling came behind the ear and spread down the upper part of the neck, when he came to the hospital. The case presented all the appearances of a mastoid abscess with Bezold's perforation. At the operation a large amount of pus was evacuated, and a ragged hole was found in the meatus. The fibres of the sterno-mastoid at their attachment were a mass of sloughs. The abscess was opened to half-way

down the neck. The mastoid cells were opened and found to be normal. Subsequently it became necessary to drain the whole sheath of the sterno-mastoid. Healing has occurred, and the membrane is normal. The site of the abscess in the meatal wall can be detected by the scarring. The patient stated that the hearing was good throughout, except when the meatus was blocked with discharge. The pus was sterile to culture.

THREE SPECIMENS OF CHRONIC MIDDLE-EAR SUPPURATION, IN EACH OF WHICH THE OPPOSITE SIDE WAS NORMAL, THE SIX BONES BEING ALL OF THE DIPLOËTIC INFANTILE TYPE.

BY ARTHUR H. CHEATLE, F.R.C.S.

Among forty-two individuals in which both temporal bones were removed, three were found to have suffered from chronic middle-ear suppuration in one ear, the other being normal. On section all six bones were found to be of the diploëtic infantile type.

Pus was present in the antrum of the suppurating bones.

(1) Male, aged forty-nine. Right side: Complete loss of membrane, malleus, and incus.

(2) Female, aged fifty-four. Left side: Perforation involving the posterior superior segment; loss of the incus.

(3) Female, aged seventy-seven. Perforation in Shrapnell's membrane. Details were destroyed accidentally by the section.

MR. CHEATLE showed the specimen as forming another link in the chain of evidence which showed how important that type of bone was in producing chronic middle-ear suppuration. He did not think that the problems presented by middle-ear suppuration could be understood unless the type was well recognised. He thought that the subject of suppuration of the middle ear, either acute or chronic, needed re-writing in the light of the recognition of the type. He regarded the term "infantile" as rather a mistake, because he thought that in infancy it was settled what the bone was going to be, whether cellular or diploëtic. He thought the type should be known as the "diploëtic," always remembering that a dense outer antral wall was present and that a dense layer of bone separated the cavity of the antrum from the diploëtic mastoid mass.

MR. WEST remarked that all the members, whether they were prepared to go as far as the President or not, were bound to admit that those six bones formed a link in the President's argument. That in all the three cases there should have been suppuration on one side, while the other side had no history of suppuration, and that in all six bones there should be that particular type of anatomy, was an apparently striking conjunction of facts; but he did not really think Mr. Cheatle's case would have been weakened by disagreement, nor was it much strengthened by agreement between the two sides. The experience of most people had been that it by no means followed that, because the bone on one side was of the compact type, therefore the bone on the other side was of the same type. Supposing, therefore, that the other mastoids had been cellular, it would have been admissible to say that it was but a small group of cases, that it was a mere coincidence in these cases, and that it meant nothing. From the point of view of those who doubted the certainty of the significance of the infantile type as a primary condition, the converse held that the argument from these six bones was not as strong as at first it appeared to be.

Mr. CHARLES HEATH said he considered that symmetry was the rule, although exceptions were occasionally seen. He did not consider that exceptions were as frequent as Mr. West suggested. The point was, that before operating on an ear it was not known whether the skull was of the infantile type or not; and once an operation was commenced it had to be gone through with. Therefore the difference was more a pathological than a practical one.

Dr. DAN MCKENZIE considered that it was possible to ascertain which kind of bone one was dealing with; and recently work done in X-ray departments had made the matter much clearer.

Dr. MILLIGAN said that although he admitted that the President's theory held good up to a certain point, and that the infantile type of temporal bone was very important in practice, he thought they were running away from the pathological aspects of many temporal bones. Many bones which were classed as of the infantile type were osteosclerotic, and that condition was of pathological origin.

Mr. SYDNEY SCOTT said that anyone who went through Mr. Cheatle's collection and compared what was demonstrable there with what one found during operative procedures could not fail to agree with Mr. Cheatle's teaching on that subject.

Mr. CHEATLE, in reply, said he knew that the type was not always symmetrical; sometimes the cellular type of bone was found on one side and the diploëtic type on the other. He agreed with Dr. Dan McKenzie that the X rays would be a help in the future in ascertaining the type of bone in the living subject before operating. In answer to Dr. Milligan, he was content to leave the matter to future investigations; he was convinced it would be found that the type mentioned did exist, that it was largely responsible for chronic suppuration, and that the density of the outer antral wall was not due to osteo-sclerosis. There might be some little osteo-sclerosis in the cells which lined the outer antral wall, but it was absurd to think that the density of bone associated with the type, which could be seen all through life, at all ages and in both sexes, without any evidence of disease, was due to suppuration. He could not believe it.

Dr. MILLIGAN explained that he believed in the infantile type, but he also believed in the osteo-sclerotic type.

Mr. CHEATLE, in further reply, said he wished to make the position quite clear. Most of the cases of chronic suppuration, apart from tubercle, began in scarlet fever or measles, or some other infective disease. If the antrum became infected in a cellular bone a mastoid abscess resulted, but if in the diploëtic type several things might happen: (1) It might get well; (2) it might cause complications in the middle or posterior fossa, or in the labyrinth; or (3) it might result in a chronic discharge from the middle-ear tract. His point was that cases of chronic suppuration mostly originated in scarlet fever or measles, and that the type was responsible for the condition.

PERIOTIC BONES OF FOSSIL CETACEA.

By W. JOHNSON HORNE, M.D.

The inner ear of the Cetacea is contained in the periotic bone, which is not attached to the other bones of the skull by an osseous connection

in many species. When, therefore, maceration occurs, the bone may drop out. The specimens shown are fossilised examples of the periotic bone.

The chief interest is to be found in specimen No. 1. It will be observed that the round window is not completed in its circumference, but tails off posteriorly into a narrow cleft, which, so far as can be seen, reaches downwards to the aqueduct of the cochlea in its whole length. It is interesting to note that this condition is not found in specimens Nos. 2 and 3, and in specimen No. 4 the bone has been broken at a point in the cochlea above the junction of the aqueduct, so that it is not possible to say whether the cleft existed in this specimen. The condition has not been described in any of the living Cetacea, and, indeed, has only once been referred to at all in any animal, this being in the case of the dugong. In the latter the cleft is much larger.

[For the above description Dr. Jobson Horne is indebted to Dr. Albert A. Gray.]

Dr. GRAY remarked that these fossil bones were very interesting. With regard to the period in geological history to which they belonged, those particular ones were probably not earlier than the Miocene or Pleiocene strata, although the Cetacea were found in the Eocene. The chief interest lay in the fact that if one found the round window and traced it round its lip there was, in one of the specimens, a cleft running backward along the floor of the aqueduct of the cochlea—*i. e.* the round window was not a complete ring. He found this first in the Sirenia, but had not observed it in any of the living Cetacea. Fortunately, however, Dr. Westmacott that day showed specimens from a whale caught near Spitzbergen, in which the cleft was very marked—*i. e.* the aqueduct of the cochlea is not a complete bony tube, but is merely closed below by a membrane. The cleft runs right up to the round window. This was interesting physiologically, because it showed that the labyrinth was not a closed cavity, as we had been taught to consider it. There had been a discussion about the effect of increased tension in the labyrinth, and much had been said about affections of ossicles causing differences in the tension of the labyrinthine fluids. In the human subject the aqueduct of the cochlea was no thicker than a hair, but in most animals it was a wide tube, and there could be no differences of tension between the fluid in the labyrinth and that in the cranium. The only condition in which such differences could occur would be when the aqueduct of the cochlea became blocked up. Much had been written and spoken about the physiology of the labyrinth and the pathological conditions in the organ due to changes in tension, but those statements should be received with great caution. Dr. Gray suggested to Dr. Horne that the specimens might supply the link between the cochlea of the ornithorhynchus and that of other mammals. It was remarkable that there should be no transition stages between the slightly bent tube of the Monotreme cochlea and the one and a half turns of the Cetacea. Possibly these fossils might show it. The sections might also show the semicircular canals, hardly larger than those of the mouse, in situation.

Dr. JOHNSON HORNE, in reply, said that he fully concurred with the views that had been expressed by Dr. Gray. As the specimens were of unusual interest, he (Dr. Horne) had decided to have them photographed before being cut by a lapidary. Subsequently the sections themselves he would have photographed. He would show the sections and photographs at a future meeting of the Section.

LABYRINTHINE VERTIGO (MÉNIÈRE'S SYMPTOMS—NON-INFECTIVE)
TREATED BY OPERATION.

By G. J. JENKINS, F.R.C.S.

M. T—, aged twenty-three, single. Occupation, cutter; has never worked in a noise. The patient complained of vertigo and tinnitus and deafness in the left ear.

Previous History.—Pneumonia at the age of six. Abscess in the neck (scar at the angle of right lower jaw) soon after the pneumonia. Measles at the age of thirteen. Influenza two and a half years ago. The patient has often complained of cold extremities to members of her family.

Family History.—An older sister has chronic otorrhea both sides, following scarlet fever. Mother confined to the house with osteo-arthritis. No history of nerve disease in the family.

History of the Present Condition. Tinnitus: A "steam-escaping" noise was the first noticed symptom and came on about four years ago in the left ear. For the first few months the noises did not annoy the patient very much, but subsequently she consulted an aural surgeon, who treated her for anæmia. There was no improvement under treatment. Immediately after the influenzal attack the noises became much worse and have troubled the patient up to the present time. There appears to have been some improvement in the condition at times. Vertigo: The first attack came on about nine months to a year ago, when standing cutting cloth in the workroom. During the attack, which lasted about half an hour in the acute stage, the patient said that "everything seemed to be tearing round" (? direction), and even when supported she had to "hold on" to steady herself. Patient does not remember in which direction she was inclined to fall. Soon after the onset of the attack there was vomiting and nausea which lasted about an hour. There have been attacks off and on since the above—once or twice in the month usually associated with vomiting and increase in tinnitus. Between attacks the patient has been able to walk about without assistance, but unfit for work. Deafness: Impairment of hearing noticed four years ago, but thought to be due to the tinnitus. Much worse after influenza. Patient not sure whether or not deafness increased after attacks of vertigo. There is no history of earache nor aural discharge at any time. Since the influenza she has often had severe left occipital and left upper parietal headaches.

Condition on examination (February 17, 1911): Tympanic membrane pale both sides; no cicatrices. Hearing—C² fork: Weber to the right, Rinne position, both right and left. Bone-conduction (Schwabach): Right normal, left much diminished. Conversational voice: Right, 18 ft. +; left, 3 ft. to 4 ft. Whisper: Right, 18 ft. +; left, about 1 ft. Inflation did not improve hearing on left side. Eustachian tube patent. Rombergism: Fell to the left and backwards; could not walk along straight line, falling usually to the left side; vertigo readily produced by quick movements of the head; rotation tests not applied. No spontaneous nystagmus. Caloric tests: Cold water did not produce nystagmus from test to either ear. Vertigo was well marked and prompt in appearance in case of right ear, but in left was delayed and less marked.

Physician's report: The patient appears healthy except for the vasomotor disturbance noted above. There is no evidence of any

lesion of the central nervous system. Blood-pressure 117 (R. R.). No blood disease. No nucleo-albumen in the urine. No evidence of exophthalmic goitre. Eyes normal.

The patient was ordered acid hydrobromic mixture and treated as an out-patient. She did not improve, and was taken into the German Hospital and treated by absolute rest in bed and given a diet of milk only; the hydrobromic acid was continued. During the ten days under treatment in hospital there was no return of her trouble whilst in bed, and only a slight attack of vertigo when allowed to move about the ward. She left the hospital at the end of about two weeks, and continued treatment at home on a slightly fuller diet.

March 3.—Patient had a very severe attack of vertigo two days ago. Fell to the left and struck her nose, causing it to bleed. No vomiting, but tinnitus much worse. Rinne (C^2), right and left positive; Weber, (C^2) to right. Bone-conduction (Schwabach) much diminished to left side. Conversational voice—right, 18 ft. +; left, 1 ft. Whisper—right, 18 ft. +; left, 2 in. to 3 in. Patient nervous and frightened. The patient looked ill and was again admitted to hospital for observation. She had two attacks of vertigo, during which she had to be supported if she attempted to move in the ward. There seemed to me evidence of increased labyrinthine pressure, and convinced of this, I decided to relieve the tension by operation.¹

The operation: By a post-aural incision the antrum was opened. The bone was healthy. By means of a very fine burr the membranous external semicircular canal was exposed for about 1.5 mm. and opened. My object was, if possible, to open only the peri-lymphatic space. There was no obvious escape of perilymph or blood. At the time of the opening of the canal the anaesthesia was light and a definite effect similar to shock was noticed. The pulse was slow and small. The patient became very pale and perspired. No deviation of the eyes was noticed (but might have been missed in the attention devoted to the general condition). A fine wick drain was placed in the lower part of the wound from the canal to the surface, and the upper part of the wound closed. Dressed with double cyanide gauze.

Three hours after the operation there was severe vertigo, spontaneous nystagmus, and almost continuous vomiting. Face upwards the nystagmus was very coarse, rotatory left to right, and oblique up and to right. The nystagmus present in all positions of the eye. The night following operation patient slept badly though given potassium bromide *per rectum*, and nausea very troublesome. On day following operation vertigo severe on slightest movement of the head. The wound was dressed, and the gauze forming the immediate dressing was soaked with serous fluid. Two days after the operation the patient was feeling comfortable and sleeping well, though occasionally suffering from nausea. Vertigo readily produced by movement of the head. The voluntary nystagmus almost purely rotatory, but there was some horizontal movement. Conversational noise heard left side 6 ft. +. Volunteered statement again that noises had entirely ceased. Four days after operation the gauze wick was removed and much serous fluid escaped, as if it had been dammed back. Six days after operation, still spontaneous nystagmus similar to that described above. No tinnitus. Conversational voice

¹ I find that Mr. Arthur Cheate had, in 1897, thought it possible that operative treatment might be advisable in such conditions (see *Archives of Otolaryngology*, New York, 1897, xxvi, p. 185).

heard in affected ear 15 ft., single words in some cases 12 ft. Cold water (ice cold) in the left ear did not produce any obvious change in nystagmus. When patient sat up there was tendency to fall to right.

Patient was out of bed fourteen days after operation, and left the hospital a few days later. She had some return of the tinnitus in a mild form on the sixth day after operation following the syringing.

May 6 (four weeks after operation): Hearing: Conversational voice, right, 21 ft. +; left, 15 ft. Whisper: Right, full; left, 3 ft. A well-fitting rubber plug, smeared with vaseline, was put in the right meatus when testing the left ear, as was done before the operation. With Bárány's Lärm apparatus in the right meatus, conversational voice was heard only about 6 in. by left ear. Highest tones of Galton whistle well heard; low tone-limit below C². Rombergism: Stands steadily with eyes shut; can walk straight line better than before operation. Vertigo readily produced by movement of the head in plane of the left posterior semicircular canal. Nystagmus: Very fine indefinable movement on looking to the right. Caloric tests: Tap cold water (for two minutes) does not produce alteration in nystagmoid movement. Rotation tests: Vertical position—no nystagmus produced by rotation in either direction; left to right rotation produced vertigo, patient tending to fall to right; right to left rotation produced less marked vertigo, with tendency to fall backwards. There is a mild tinnitus, which does not, however, annoy the patient.

The PRESIDENT said the case was important because, as far as he knew, it was the first time that the procedure had been adopted for the relief of vertigo, tinnitus, and deafness. It was also important from a pathological point of view, as well as the physiological, because of the results obtained.

Mr. SYDNEY SCOTT said it was necessary in such cases to emphasise the fact that the vertigo was not of that type the pathology of which members knew. In this case one did not know what the vertigo was due to, because there was no middle-ear suppuration. He would like to see an indication of that embodied in the title, to distinguish it from labyrinthine vertigo secondary to middle-ear disease.

Dr. DAN MCKENZIE regarded the case as very suggestive; it opened the door to many trains of thought. There were one or two points, however, which bade one be cautious. One was the possibility of the vertigo being due to some disease other than in the labyrinth. He did not see a note of an attempt being made to discriminate between the labyrinthine type of vertigo and the cerebellar type by altering the position of the patient's head in testing for Rombergism. Putting those possibilities on one side, and assuming it to be labyrinthine vertigo, it was a case which would encourage us to perform the same type of operation in other cases of the same kind. A most interesting question was, why had the hearing improved so much? There were several possibilities, one being (*pace* Dr. Albert Gray) that the relief of the tension by the escape of fluid might account for the improvement of the hearing. But he thought it was more likely that by his operation Mr. Jenkins provided a new fenestra, and by that means it was possible that the sound waves reached the cochlea in a better manner than they did formerly. The objection to this explanation was that the case had shown no sign of middle-ear disease. After the operation there no evidence in testing the labyrinth that the semi-circular system was still active. It seemed as if the operation had destroyed the function of the semi-circular canal, and so removed

the vertigo. Possibly the operation destroyed the action of the semi-circular canals, but did not destroy the cochlear action; from which one might argue that it was possible to have a lesion in the semi-circular canals definitely localised to that part of the labyrinth, and not affecting the cochlea at all. It was, of course, possible to have suppuration localised to the canalicular system and sparing the cochlear.

Mr. JENKINS, in reply, said he agreed to Mr. Scott's suggestion, as it was likely there might be confusion from the title given (the title has been altered accordingly). Bárány's tests were applied, and there was no evidence of cerebellar vertigo. He thought the labyrinth was certainly active on the affected side, as the caloric tests produced definite vertigo when applied to that side.

A CASE OF LEPROSY WITH INVOLVEMENT OF THE EXTERNAL EARS, PALATE, PHARYNX, ETC.

By G. N. BIGGS, B.S.

Full notes of this case, which is shown by permission of Sir Malcolm Morris, K.C.V.O., will be found in the *Proceedings of the Royal Society of Medicine* (Dermatological Section), 1909.¹ Since this date the patient has been treated with injections of mastin and a vaccine of *Staphylococcus aureus*.

The auricles are much enlarged, and present the typical shiny and thickened appearance characteristic of the disease. There are tubercles present, and in some cases these have broken down and ulcerated. The tubercles are most numerous on the palate, but also extend down and involve the vocal cords and ventricular bands. Ulcers due to the breaking down of tubercles are also present in the nasal cavities.

A CASE OF SYPHILITIC DISEASE OF THE NOSE TREATED WITH "606."

By G. N. BIGGS, B.S.

Patient, aged thirty-two; three children all healthy; no miscarriages. Has suffered from sore throat and discharge from the nose for five years. This patient has been thoroughly treated by mercury and potassium iodide by the mouth in large doses and mercurial inunctions over a period of eighteen months, and in spite of this the disease has been progressing rapidly. In January last the disease became much more active; there was extensive ulceration of the soft and hard palate, and the naso-pharynx, the septum and turbinate bones had been completely destroyed, and the nasal cavity was extensively ulcerated.

Ulceration commenced at the alae nasi and extended over the rest of the nose, assuming almost the appearance of a malignant growth. On April 1, 1911, an intra-venous injection of salvarsan (0.4 grm.) was given. At the present time—*i.e.* six weeks after the injection—the ulceration has quite healed and the growth quite disappeared.

Photographs of the patient before the injection and ten days after are exhibited to show the rapid effect of the drug.

The case is of special interest as it was one which, in spite of very active treatment, was rapidly progressing, and would have rapidly terminated fatally in the absence of this drug.

¹ *Proceedings*, 1909, vol. ii (Dermat. Sect.), p. 41.

NOTES OF A CASE OF TEMPORARY DEAFNESS AND BLINDNESS DUE TO
INTESTINAL TOXÆMIA.

BY A. L. WHITEHEAD, B.S.

G. M. —, male, aged fifty-three. Good general health, and no defect in hearing or in vision, beyond a little short-sight, up to March 5, 1910. About that date he began to suffer from headache with general malaise, but without elevation of temperature: this continued up to March 12, on which day the headache was more intense, and he noticed that his hearing was defective. This defect rapidly increased, so that by 5.30 in the evening he could not hear even the loudest voice with either ear; about the same time his vision commenced to fail, and in about an hour he had lost even perception of light in both eyes. His medical attendant saw him at this time and found almost complete deafness, only very loud noises being heard; no tuning-fork tests were made. No perception of light was present, the pupils were dilated and immobile, discs pale, retinal arteries reduced to threads, veins normal. Knee and plantar reflexes normal, no paralysis of any muscles: mind clear; temperature normal.

A previous history of constipation caused the administration of a large dose of calomel; this was followed by a copious evacuation of very offensive fæces, and about 10.30 the following morning the hearing commenced to return, and was, in a few hours, restored to normal. His vision gradually returned during the same day, but for some days was not equal to what it had been prior to the attack. On March 19 he was seen by me, and the hearing found to be normal, the membrana tympani, nose, etc., all being normal. Vision on this date was normal, with glasses correcting a small degree of myopic astigmatism, although the discs still appeared a little pale and the arteries small.

This seems to have been a case of intestinal toxæmia, causing spasm of the arteries, and so anæmia and temporary abolition of function of the optic and auditory nerve-endings. In the recorded cases of anæmia of the labyrinth tinnitus and vertigo seem to have been always present: in the present case these symptoms were entirely absent. There has been no return of any aural or ocular defect during the twelve months since the attack.

The PRESIDENT said it would be difficult for Mr. Whitehead to convince members scientifically that the case was one of intestinal toxæmia. If that were the cause of the condition, as constipation was so common, why were not temporary deafness and blindness more frequent accompaniments? He asked whether there was any question of neurosis in the case, or had the patient been taking any drugs, such as quinine, salicylates, or cinchona?

Dr. BRONNER suggested that the faradic current should be tried in such a case. A few days ago he had a patient who said she was nearly blind and that she could not hear anything. Her doctor thought it was syphilis of the brain. The faradic current was applied and the hearing and vision improved at once.

Dr. WATSON-WILLIAMS said the case was so obscure that at best one could only suggest as the cause something in the nature of a hypothesis. At a previous meeting he had brought up a case of recurring temporary deafness, the deafness coming on in a few minutes, remaining absolute for a few hours, and then passing off. That happened on several occasions, and was increased by exertion, and the patient died with symptoms

pointing to cerebral hæmorrhage. No autopsy was allowed. He thought there was strong evidence in that case that there was some organic pathological vascular condition, and possibly some such explanation might account for the temporary deafness in the case now exhibited.

Dr. DAN MCKENZIE asked what was meant by the phrase "anæmia of the labyrinth." Probably there was such a disease, but he did not know on what facts the diagnosis was based.

Mr. WHITEHEAD, in reply, said the patient was healthy and had been taking no drugs. There had been perfect health before this condition occurred. There could be no suspicion of hysteria. "Anæmia of the labyrinth" was a phrase of Politzer. He brought the case forward because it was a puzzle to him. The only suggestion he could make was that it was due to intestinal toxæmia. As Dr. Watson-Williams said, the defect was clearly vascular. One would think, from the condition of the retinal vessels, that the vascular supply to the nerve-endings of the labyrinth was much reduced. He believed there were cases analogous recorded in ophthalmic literature, due to fungus-poisoning, in which there was temporary anæmia of the retina. But a case of the kind in otology he believed to be rare. The only reference he could find was a casual one in Politzer's book.

SEQUESTRATION OF BONY LABYRINTH IN A BOY, AGED FOUR.

By F. H. WESTMACOTT, F.R.C.S.

THE boy had tuberculous disease of each temporal bone, and was operated upon on both sides. Each ear showed extensive tracking in various directions. The sequestrum came from the right side some months after an incomplete mastoid operation. There was facial paralysis early in the disease on this side. Complete recovery resulted, but with permanent paralysis on right side.

EIGHT SPECIMENS OF THE OTIC ELEMENT OF THE ARCTIC WHALE.

By F. H. WESTMACOTT, F.R.C.S.

These specimens were typical and selected examples obtained from Spitzbergen, and showed the anatomical features in a clear and distinct manner.

CAST OF CAVITY IN THE LEFT MASTOID PROCESS OF A WOMAN, AGED SEVENTY-FIVE, FILLED WITH CHOLESTEATOMA—SMOOTH POLISHED SURFACES.

By F. H. WESTMACOTT, F.R.C.S.

History of scarlatinal otorrhœa forty years previously. Death followed from asthenia five days after operation; no suppuration occurred.

Mr. HUGH E. JONES asked for what symptoms the operation was performed in the last-named case.

Dr. H. J. DAVIS said he had at present a case of a large cholesteatoma in a boy, and there was an enormous erosion of bone; on removing the pulvaceous mass the lateral sinus gave way. There was very severe hæmorrhage, and later secondary hæmorrhage, but he was now going on well.

Mr. WESTMACOTT, in reply, said the operation was performed for intense pain over the mastoid and extreme tenderness. There was a history of otorrhea forty years before, and some cholesteatomatous material in the meatus. The cavity was a large one, the upper limit being far above the normal level. There was no opportunity for an autopsy, but there must have been a good deal of elevation of the roof of the temporal bone in the cranial cavity.

EIGHT CASES OF MASTOID OPERATION.

By CHARLES J. HEATH, F.R.C.S.

CASE 1.—Female. The right ear had suppurated practically all her life, with the exception which the patient's letter indicates: "Two years previous to coming under your observation the right ear, which had freely discharged all my life, stopped doing so for six months, during which I had facial paralysis. When my face regained its normal condition the ear started to discharge again, which continued until you operated." The radical operation was performed as the ear was utterly disorganised. The left ear subsequently became involved without any apparent cause, and after suppurating for a few weeks the patient came again under observation. Operation was performed without delay, because, symmetry being the rule in tympanic conditions, the course of suppuration in this ear was likely to be a destructive one, as it had been in the other. The hearing of the other ear was already defective. No cholesteatoma was found, though the antrum was carious, and as the bony elements appeared to be intact the conservative operation was performed. Recovery was rapid, and the perforation healed. Some time afterwards tinnitus supervened and became severe and continuous. The hearing also became impaired. After much hesitation and delay it was decided to proceed to the radical operation.

This case shows that in some cases fairly early conservative operation may put an end to the disease, yet not restore perfectly satisfactory conditions. It still appears to justify reasonably early interference. In this case, as in most of the cases exhibited, it will be seen that the antrum has been induced to fill up, thus obviating the necessity for occasional subsequent removal of desquamated material.

Mr. TOP asked what Mr. Heath meant by saying that the antrum had been induced to fill up?

Dr. MILLIGAN asked what was meant by "the left ear subsequently became involved without any apparent cause, and after suppurating for a few weeks, the patient came again under observation. Operation was performed without delay, because, symmetry being the rule in tympanic conditions," etc. He asked whether no attempt was made to treat the ear by local measures. It could not have been anything very acute.

Mr. STUART-LOW said that in a considerable proportion of the cases that he had seen in which the so-called "conservative operation" had been performed, all that was accomplished could have been attained if the simpler and safer subcortical operation only had been done. If the teeth, the nose, and the pharynx were attended to and cleared of disease and disturbance, and the mastoid antrum opened and drained, the great majority of recent antral suppurations soon got well, and no further operation such as Mr. Heath advocated and performed in this case was necessary.

Mr. WHITEHEAD asked what was the nature and extent of the disease found in the mastoid antrum at the time of the operation, since the reported notes gave no information on this point. Would Mr. Heath also state precisely what was the degree of hearing before and after the operation.

Mr. HUGH E. JONES remarked that the patient heard his watch at 15 in. after the radical mastoid operation had been performed, showing that the hearing was not necessarily destroyed by that operation (as had been repeatedly stated by Mr. Heath to be the case).

Mr. HEATH, in reply, said none of the operations on his cases shown that day were Schwartze's. In answer to Mr. Stuart-Low, he said a conservative operation was done, the perforation healed, and the hearing was good. A few weeks later severe tinnitus came on, and because of that radical operation was performed. Naturally he thought that something was wrong with the tympanum. The radical operation was carried out against his desire, but evidently the result was perfect. The other ear had been lost, and if one ear on becoming diseased went to the bad, its fellow, if attacked, was liable to follow suit. That was his reason for operating more quickly than usual. In answer to Mr. Tod, the antrum was induced to fill up by treating it in such a way as to favour the formation of granulations, and making as small removal of bone at the operation as was consistent with removal of all disease, so that the small cavity readily filled in. He had never known the mastoid antrum opened during suppuration without finding disease. He would rectify in the notes the omission of the statement that disease was found.

CASE 2.—Male, twenty-eight years' suppuration in the left ear. Gradually increasing deafness until it interfered with work, and he attended the Throat Hospital. More than the lower half of the membrana tympani had already been destroyed. The ossicles were apparently intact. The other ear having become deaf though non-suppurative catarrh, operation on the suppurating one was carried out in the hope of preserving some useful hearing. No cholesteatoma being found, the proceeding was concluded as a conservative operation. A photograph is shown of the condition of the drum at the time of operation. Within three weeks the patient returned to work with greatly improved hearing. The destroyed portion of the membrane was all replaced during the five months following operation. Now the ear is sound and hearing good. Exhibited to demonstrate the great extent of repair which will occasionally occur, and to show that long duration does not necessarily render complete cure impossible.

Dr. MILLIGAN said he was at a loss to know what the special operation was. In answer to Mr. Tod, Mr. Heath said he cut away a small amount of bone, and that the antrum became obliterated. But this antrum had not healed up; it was an epithelialised cavity. He did not reconcile Mr. Heath's reply with what was to be seen in the patients. The antrum was not obliterated.

Dr. FITZGERALD POWELL wished to draw attention to the following sentence in Mr. Heath's report of the case: "The other ear having become deaf through non-suppurative catarrh, operation on the suppurating one was carried out in the hope of preserving some useful hearing," and said that he could not agree as to this particular operation preserving the hearing any more than the complete or radical operation did. The primary object of the mastoid operation was to make the patient's condition safe and free from the danger of further infection. The condition of the hearing did not depend on this operation or on that, but depended on

the condition of the labyrinth, the inner wall of the tympanum, the stapes, and the oval and round windows, if these structures were not interfered with during operation. The hearing would be as good after radical operation as after the one advocated by Mr. Heath, viz. a modified Schwartz's.

Dr. BRONNER asked whether Mr. Heath had tried ordinary treatment first. The weak point in all his cases was that he had not tried other means before adopting his own method. Everyone had seen cases of suppurating ears, in which the patient could not hear at all, yet by ordinary methods of treatment the hearing had become practically normal, although Mr. Heath's operation had not been done. If other methods had been tried first in Mr. Heath's cases, his remarks would have been more convincing. Surely even Mr. Heath's operation was attended by a certain amount of risk as regards life and hearing; all cases certainly did not recover their hearing. It was unjustifiable, and contrary to the elementary principles of surgery, to submit a patient to a major operation without trying the simple ordinary methods of treatment first. Dr. Bronner strongly objected to Mr. Heath's statements that in all cases of otorrhœa, even of short duration, the antrum was diseased, and the cause of the persistence of the discharge.

Mr. HEATH, in replying, said there was disease of the antrum; he had never seen a mastoid operation for aural suppuration without disease in the antrum. In these cases he found a cavity not clean and shining, such as in health, but one which was reddened and moistened with purulent matter. In answer to Dr. Milligan it was not a radical operation; those which were radical did not fill up; those which were not radical operations had, with one exception, filled up, and that exception he had referred to. In answer to Dr. Powell, in his experience hearing was not so good after the radical method, nor was the probability of saving hearing. He did the operation with the idea of preserving some useful hearing. The man had lost the other ear, and the remaining ear was so bad that he was threatened with the loss of his living, so that one was not justified in treating him longer with drops and lotions. The ear had been discharging twenty-eight years, and he had lost more than half his drum. In answer to the President there was not a repetition of the original membrane; it was scar membrane; there was no aperture through it. This patient had been treated for some time at the hospital before operation, and was threatened with loss of his situation if his deafness continued.

CASE 3.—Female, sent for advice on account of headaches, with an inquiry as to whether the mastoid operation, by putting an end to the suppuration, would diminish the painful attacks. Both ears had been discharging continuously for thirty-eight years. The left, the worse ear, which showed a perforation involving one third of the drum membrane, was submitted to operation. The tympanum appeared full of swollen mucous membrane, though there was no sign of cholesteatoma. The ear rapidly recovered the excellent condition in which it is now to be seen. The large perforation has healed. The hearing has returned. Two years later, in consequence of the patient's desire to get rid of the annoyance of continuous treatment of the other ear, that one was submitted to an operation of the same kind. This was after forty years of continuous discharge. There were two perforations in the membrane of this ear, one in front of and the other behind the malleus. The result is equally successful. There is perfect restoration of structure and function. This case is shown to prove that duration does not necessarily affect the

prospect of repair after operation, and that the possibility of cure depends on tympanic conditions.

Mr. WHITEHEAD repeated his question, and would wish to do so in every one of the cases. In none had Mr. Heath stated the details, with two exceptions, and whether he found enough disease to justify the operation.

Mr. HUGH E. JONES asked what was the size of the antrum, and whether it was an "infantile" or cellular mastoid, because that made a great deal of difference in the ultimate size of the cavity left after operation.

Mr. TOD asked what was meant by the statement, "the possibility of cure depends on tympanic conditions." He asked, because in the next case it was stated that the antrum was the usual cause of the suppuration.

Dr. KELSON asked if Mr. Heath meant that after twenty-eight years of suppuration there was perfect restoration of structure and function, as stated in the notes of the case.

Mr. HEATH, in reply, said he did not recollect that the antrum was the only part of the middle ear which was diseased, for the tympanum always suffered. He eliminated what disease was apparent in the antrum only. The PRESIDENT: I presume, then, you cannot answer Mr. Whitehead's question. Mr. Heath, continuing, said the antral lining was diseased and removed, and that was sufficient to lead to the recovery of the case. In answer to Mr. Jones, the only large cavity, except those following the radical operations, was in Case 7, in which it still remained large, and this size was due to the disease which had existed before operation, and pointed to the necessity of interfering before such extensive destruction had occurred. In answer to Mr. Tod, the tympanic condition regulated the possibility of cure after the antrum had been dealt with. If the tympanum was not past repair the patients would get well; if the tympanum was disorganised the case would not get well, whatever was done to the antrum or tympanum.

CASE 4. Male. Suppuration in both ears for eighteen months. Patient being an engineer at sea, he was anxious to get rid of all disease before returning to work. There was a slightly foul discharge with eczema of the meatus on each side. Under a single anæsthetic conservative mastoid operation was performed on both ears. No sign of cholesteatoma was found. The perforations healed rapidly, and the antral cavities filled up. Now the patient has sound ears and good hearing. My colleague, Mr. Walker Wood, performed a Killian resection of the nasal septum. Exhibited to prove that the antrum is the usual cause of persistent suppuration — certainly until the tympanum is disorganised and destroyed as an organ of hearing.

Mr. WHITEHEAD said it seemed scarcely of any use to ask questions, as members could not get the accurate facts with regard to the disease and the condition of the hearing, and in the absence of these facts any discussion on the cases was futile.

Mr. STUART-LOW said that he had had the advantage of seeing this patient, as Mr. Heath had sent him on for inspection. The discharge had ceased, and the hearing was good, but in his opinion, quite as good a result could have been attained if, the nose and throat being attended to, the mastoid antrum only had been opened and drained. The discharge had only been going on for eighteen months, and with such a short history, as a rule, the subcortical operation was sufficient to cure the discharge and restore the hearing.

The PRESIDENT asked what evidence of disease was found in the antrum.

Mr. HEATH, in reply, said, in reference to Mr. Stuart-Low's remark, that they were agreed that some suppurating ear cases got well after nasal operations. In answer to Dr. Pernewan, he pleaded guilty to not having referred to the hospital reports in the cases; he thought the notes he gave would suffice for the foundation of a discussion. Accurate reports of the cases were kept, and he would be glad to know if it would satisfy members if he handed the hospital records in afterwards. In answer to Mr. Scott, the smallest opening was made in the antrum in every case consistent with inspection. The smaller the opening the more rapidly did it fill up. It was for this purpose that it was kept as small as was consistent with the removal of all the disease. With regard to the disease which was found in the antrum, all of them showed evidence which was not in harmony with a healthy ear. This patient was also treated for several months before operation.

CASE 5.—E. S.—, scarlet fever seven years ago. Perforation and discharge ever since. Three operations for adenoids at the Throat Hospital. The disease became suddenly acute and the patient came to the hospital on November 9, 1906. During the operation he was enabled to see a perforation, though it could not be located through the intact meatus. It healed in nine days, and the patient left the hospital on the fifteenth day. This case shows that if the removal of adenoids does not ensure recovery, it is unwise to delay indefinitely the performance of a conservative mastoid operation.

Mr. Ton remarked on the statement that the disease "became suddenly acute." He asked whether there were mastoid symptoms. Was there suppuration for a day or two, or how long was there suppuration?

Mr. HEATH, in reply, said the suppuration has lasted seven years, and the acute mastoid trouble supervened. There had been three operations for adenoids in the hope of bringing the ear disease to an end. Pus was present in the antrum.

CASE 6.—Male. Post-influenzal earache for six days before the membrane burst in Shrapnell's portion. The patient was first seen two days afterwards. There had been one attack some years before. The hearing of the other ear was defective. The patient could not blow air through the perforation. He was blistered behind the ear, ordered salicylate of soda internally, and dilute glycerine of carbolic acid drops in the meatus. Syringing was forbidden, and he was advised to come to the hospital the following week. On his coming again he was still unable to blow air through by Valsalva's method. The deafness had increased. There was slight giddiness, and occasional slight earache. The earache could not be tympanic, because the perforation was draining the tympanum, therefore it was considered that the antral secretions were retained. It was therefore decided to operate immediately, as the other ear was permanently damaged. Pus was found pent up in the antrum. An accumulation of cells, preliminary to cholesteatoma, was discovered in the attic and washed out when the cannula was used. This case was shown to illustrate the possibility of very early commencement of cholesteatoma, and the conditions which predispose to it. Also to exemplify the delay in bursting of the membrane when Shrapnell's portion is the only part exposed to fluid pressure.

Dr. MILLIGAN said he desired to make a definite protest against the line of treatment adopted in this case. It was an ordinary post-influenzal

otitis media, of six days' duration, yet immediately the post-aural operation was performed. Presumably there was tubo-tympanic catarrh with stenosis of the Eustachian tube, and the slight earache was due to intra-tympanic tension. Mr. Heath said "an accumulation of cells, preliminary to cholesteatoma, was discovered in the attic and washed out when the cannula was used." Was it in the experience of members that a case which had gone on for not more than fourteen days had a cholesteatoma, or even an indication of it? If the case had been treated on rational lines there would have been no necessity for any form of post-aural operation. He protested more especially because the hearing in the other ear was defective. The patient has been submitted to an unnecessary operation, and there was the off-chance of abolishing hearing altogether by the operation.

Mr. STUART-LOW said that he was gratified to find that Mr. Heath had forbidden syringing in this case, as he had for years strongly deprecated all syringing in the treatment of ear discharge as likely to drive the sepsis further afield. He attributed Mr. Heath's good result in this case to the inhibition of all syringing.

Mr. HEATH, in reply, said Dr. Milligan's protest was a natural one, but on the notes he did not think it was justified. At the time he saw the patient a north of England surgeon also saw him, and he told that surgeon he would operate that day at the hospital for four reasons: (1) There was pain, which was not tympanic, as there was a perforation draining that cavity, therefore the pain could only be due to retention of discharge in the antrum; (2) hearing was getting worse, which implied tympanic swelling and progressive disease; (3) he was giddy, implying that somehow the labyrinth was becoming involved, probably through the pressure exerted by the tympanic swelling interfering with the position of the stapes through dragging of the long process of the incus; (4) the man had lost his other ear. The surgeon from the north saw the operation, and said he first thought the decision to operate had been arrived at on insufficient grounds, but he was glad to see the diagnosis justified upon the operating table. There was pus in the antrum, and there was acute mastoiditis which was treated early. With regard to cholesteatoma, he believed the pathology of that was not definitely settled. He looked upon the accumulation of cells in the attic as preliminary to cholesteatoma, as it kept up irritation in that cavity. The swelling of the membrane there interfered with drainage of the cavity behind it. He washed out the accumulation, and he had washed out a similar collection by a similar operation in another case three months after suppuration began, but the ear had never dried up. When squamous cells and purulent matter were allowed to remain in the attic for three months that ear was doomed.

CASE 7. R. T—, aged eight, and eight years of suppuration. Polypus in the meatus, hiding the perforation. At the operation a large antro-mastoid cavity was found filled with granulation-tissue; hence its present large size. On removal of polypus and examination of drumhead a large perforation was found, and some polypi removed through it. The ossicles appeared intact, and the cannula, when in use, exhibiting no sign of cholesteatoma: a conservative operation was performed. The perforation healed within three weeks. The operation was performed in 1906. Shown to exhibit the large mastoid cavity, and the desirability of interfering before disease had caused it to assume such dimensions.

CASE 8. J. W. T—, Ten years' suppuration. The patient's ear had been tender and deaf all his life, and became painful and deafer in

wet weather. He underwent a conservative operation in March of last year; repair was rapid; the perforation healed; the hearing returned; the long-standing tenderness also disappeared. A few weeks later he complained of neuralgic pains on that side of the head, which were difficult to explain. They would come on at varying times and were very severe. The ear looked perfectly healthy, and there was a natural objection to interfere with such an apparently satisfactory condition, but no other cause could be found for the pain. After much consideration and discussion it was decided to perform the radical operation. Even after this was done the pain continued for some time, not chiefly in the locality of the ear. In the course of a month or two the neuralgic attacks gradually passed off. This is one of the small number of persons in whom the writer has found it necessary to convert a conservative operation into a radical one. Even now there is some doubt as to whether the case was one requiring it. There was a slight tendency to stenosis of the meatus.

CASE OF CHRONIC SUPPURATIVE MASTOIDITIS, WITH ABSCESSES IN THE LEFT TEMPORO-SPHENOIDAL AND FRONTAL LOBES.

By P. WATSON-WILLIAMS, M.D.

S. S.—, female, aged twenty, was admitted to the Bristol Royal Infirmary on January 16 complaining of discharge of pus from both ears, which she said had existed since she was a small child, but which had diminished during the past few weeks. For some months she had suffered from pain in the forehead, behind the left ear and occiput, and this had increased during the last week or two. Pain at times in the forehead severe. With some intermissions, she had continued her work as a cardboard box maker, and beyond the fact that she was poorly and suffered from pain, her family had not noticed any particular change, nor had her mental condition appeared to have altered. She had had attacks of giddiness, and vomited once before her admission.

On admission the left membrana was found absent, the middle ear being full of granulations; the right membrana was perforated. Rinne test negative, right and left. She complained of screaming noises in the left ear. There was markedly double optic neuritis, with swollen oedematous retinae and hæmorrhage. Visual fields good for white and colour. There was no spontaneous nystagmus, and no nystagmus with rapid head movements. Caloric reaction, left ear, head erect: Water, 77° F.; nystagmus, 41 seconds; vomited one minute later. No fistula symptoms; no cranial nerve paralysis; reflexes normal; no dysidiadokokinesis. The cultures from the pus yielded a Gram-negative bacillus, slightly mobile, producing slight green pigment, identified as *Bacillus pyocyaneus*, in nearly pure culture; a few staphylococci; streptococci absent. (L. Walker Hall.)

January 18.—Radical mastoid operation was performed, when it was found that the dura mater was exposed in the roof of the mastoid antrum, which was infantile in type, the dura mater being thickened. After the operative area had been disinfected the dura was incised. The brain was not explored, and no pus was found. Lumbar puncture yielded clear, sterile cerebro-spinal fluid under considerably increased pressure. Patient went on well.

January 27.—Vaccines prepared from the pure culture, *Bacillus pyocyaneus*, were commenced, the initial dose being 25 million. Subse-

quently she had the following doses: January 31, 50 million; February 5, 125 million; February 14, 250 million.

January 30.—A considerable amount of pus escaped from the mastoid wound; she had complained of headache two days before, and was relieved.

February 3 and 4.—Complained of severe headache. Wound was cleaned; no purulent discharge.

February 4.—Headache continued. Mastoid wound was opened up; sinus forceps introduced through the former opening in the roof of the antrum, entered the temporo-sphenoidal lobe; about $\frac{1}{2}$ oz. pus escaped. Large drainage-tube inserted. Patient continued to do well up to February 14, when her mental condition, which had been bright, became dull. Temperature went up from being normal or subnormal to 102° F. There was no pus escaping. Pus had ceased to discharge from the temporo-sphenoidal lobe, although the drainage-tube had been kept in.

February 17.—A considerable amount of offensive purulent discharge escaped by the tube. She seemed brighter and considerably relieved.

February 23.—Became mentally duller and indifferent to surroundings. Temperature again rising, from 99° F. to 102.8° F.

February 24.—She died at 3.30 a.m., shortly before which she was restless, sitting up in bed and screaming; Cheyne-Stokes' respiration developed markedly two hours before she died.

Post-mortem.—Very slight meningitis. Abscess in the temporo-sphenoidal lobe was found well drained, but tracking forwards from the anterior end of the temporo-sphenoidal sinus was a narrow canal leading into an abscess in the left frontal lobe, which reached forward nearly to the apex of the left frontal lobe.

The interesting feature of this case appears to lie in the fact that a girl who was able to continue her work had a chronic abscess in her left temporo-sphenoidal and left frontal lobes, and there was no localising symptom. Although the left temporo-sphenoidal lobe had been well drained after the operation, it would have been difficult, even if one could have diagnosed an abscess in the frontal lobe, to have effected drainage of an abscess so situated. It is noteworthy that the pus in this case yielded *Bacillus pyogenus* in nearly pure culture.

PROCEEDINGS OF THE SCOTTISH OTOLOGICAL AND LARYNGOLOGICAL SOCIETY.

May 20, 1911.

Chairman, DR. THOMAS BARR.

Report by DR. W. S. SYME (Glasgow).

(Continued from p. 378.)

PATIENT WITH SYRINGOBULBIA, WITH IMPLICATION OF NOSE, PHARYNX,
LARYNX, ETC.

By DR. A. BROWN KELLY.

Woman, aged twenty-one, came in March complaining of hoarseness and loss of power in right arm. The hoarseness had been intermittent

for several years and constant for fourteen months. Latterly it had become worse, and when she presented herself she spoke in a falsetto voice, with slight rhinolalia aperta. Within the past year she had also begun to suffer from difficulty in mastication, so that she took a long time to her meals. There was also slight difficulty with deglutition, occasional regurgitation of fluids through the nose, and the passage of solids the "wrong way"; breathlessness on the least exertion, rapid blurring of vision for near and distant objects, a tendency to let things fall from the right hand, so that the left was always used when lifting breakables. She remarked, further, that she had occasionally burned her right hand without being aware of it till blistering had taken place.

Condition on Examination.—Nose: Right nasal fossa—Complete anæsthesia of all the lining membrane, except above the posterior end of the middle turbinate. Left nasal fossa—sensation seems dulled. Mouth and pharynx: Tough secretion is constantly collecting about the palate and root of tongue. Tongue: Atrophy of right half, protrusion normal, no tremor. Palate: Whole of right half of hard and soft palate anæsthetic on phonation; the soft palate is drawn up to the left, but does not nearly reach the posterior pharyngeal wall. Uvula: Deviated to left. Posterior wall of pharynx: Right half anæsthetic, left half normally sensitive. During phonation the right half is drawn to the left. Of the two palato-pharyngei only the left contracts. Larynx: During quiet respiration the cords are stationary, and only 2 or 3 mm. apart. On deep inspiration there is no abduction. On phonation there is slight but incomplete abduction. The right half of larynx is anæsthetic, left half fairly sensitive. Eyes: Both conjunctivæ insensitive.

Patient has had measles and scarlet fever, but no illness for twelve years. No history of nervous, tubercular, syphilitic, or malignant disease in the family.

Dr. John Love had examined the case and diagnosed syringobulbia. The exhibitor is indebted to him for pointing out the following additional features: Right masseter is atrophic, paralysed, and does not respond to electrical stimulation, and as a consequence there is flattening of this side of the face. Nystagmus on lateral and upward movement of eyes. Right shoulder droops slightly. Moderate lateral curvature to the right of the spine in the upper dorsal region. No loss of power in arms or legs, and trunk can be moved in all directions. Knee-jerks normal; no ankle-clonus: Bakinski's sign absent. Tactile sensation is absent on right side of neck, over lower jaw, and down over shoulder to level of nipple, and over right arm, excepting a narrow strip from axilla to elbow; it is blunted and delayed on left leg. Pain is diminished on both sides of face and scalp (especially on right side), on arms and legs, and on trunk above the nipples. The appreciation of heat and cold is normal on the legs and on the trunk up to the costal margin. Above this it is doubtful, and on the face, arm, and neck it is perverted. Nothing abnormal in thoracic and abdominal organs.

MYASTHENIA GRAVIS WITH IMPAIRED SPEECH.

BY DR. A. BROWN KELLY.

Boy, aged thirteen, brought in February on account of indistinct speech. First noticed a year previously; much worse recently. General weakness; fatigue rapidly produced on exertion; knees markedly affected,

and gait ungainly. General tremor: patient slow and stupid. The tongue could be perfectly protruded. On phonation the palate was only slightly raised, but it responded completely to probing. Pharynx and larynx normal. The patient was transferred to Dr. John Love, who diagnosed myasthenia gravis. At the present time his speech is scarcely intelligible, resembling that of a person partially intoxicated, and he takes a breath between every two or three words. The indistinctness appears to be due to defective action of the muscles of articulation. There is no rhinolia aperta and no vocal disability. He eats slowly, but there is no regurgitation by the nose. He can whistle feebly. On electrical stimulation the muscles round the mouth give the myasthenic reaction, but those of the soft palate do not. His face is expressionless. There is no squint, no nystagnus, no wasting of the muscles, no disturbance of sensation, no Babinski's sign. Knee-jerks active: slight ankle-clonus on right side. Nothing abnormal in thoracic or abdominal organs. No enlargement of the thymus, thyroid, or other glands can be made out.

Dr. TURNER, referring to the age of the patient, remarked that it was probably one of the youngest cases of the kind recorded.

LATERAL SINUS THROMBOSIS: OPERATION: RECOVERY.

DR. J. KERR LOVE.

M. M——, aged six, had discharge from right ear since two years of age. History of six separate rigors, the last on morning of admission to Glasgow Royal Infirmary, March 18, 1909. There was then a tender fluctuating swelling over the mastoid and the auricle projected, and there was marked peri-auricular glandular enlargement: temperature 105° F., pulse 180, respirations 40. Operation was carried out without delay: a subperiosteal abscess was evacuated, and a sinus found leading to the lower mastoid cells, but there was no opening in the bone leading to the lateral sinus. Patient became collapsed, and the radical mastoid was not performed. Examination of the pus revealed pneumococci and streptococci in equal numbers. Temperature became normal and remained so for a week, but then rose to 103°–104° F., and on March 28 another rigor occurred. On the next day, therefore, the internal jugular was tied and the lateral sinus opened. This was found filled with septic thrombus from the jugular bulb almost to the torcular, whence fluid blood escaped. With the exception of a small abscess in the lumbar region observed about April 24 no other complication occurred, and the child made a steady though tedious recovery, and left the hospital on June 3.

PATIENT FROM WHOSE EAR AN EXOSTOSIS WAS REMOVED: SPECIMEN SHOWN.

BY DR. J. GALBRAITH CONNOL.

Man, aged twenty-two, complained of deafness and tinnitus in right ear of six years' duration, with attacks of giddiness. Severe pain for the past few days. A growth noticed in the ear. Had never had any discharge from the ear. Measles at eight, but except for that has always been healthy. Examination showed a growth entirely blocking the canal. It felt hard, and was sensitive to the touch with the probe. Watch—

right $\frac{c}{40}$: left $\frac{40}{40}$. Under chloroform the auricle was dissected forward, and the growth removed with the chisel. It was then found that the tympanic membrane was largely destroyed, and the middle ear filled with foul-smelling cheesy material. A few days later the radical mastoid operation was performed. Discussing the aetiology of the exostosis he said that gout, rheumatism and syphilis were all excluded, but there was this interesting point—that up to the onset of his ear symptoms the patient had been in the habit of bathing as many as half a dozen times a day during the summer months.

Dr. THOMAS BARR remarked that some years ago he pointed out that a history of frequent bathing could usually be elicited in these cases, and that the majority came from the neighbourhood of the sea or rivers where bathing could be indulged in.

In reply to Dr. Kerr Love, Dr. CONNALL said that he did not think that the purulent discharge was the more probable factor in this case. Indeed, exostosis was more commonly met with unassociated with middle-ear suppuration.

ACUTE MIDDLE-EAR SUPPURATION ON BOTH SIDES WITH INVOLVEMENT OF THE LEFT SIGMOID SINUS.

By DR. J. GALBRAITH CONNALL.

A girl, aged six. Five weeks before being seen for the first time she had mumps. A fortnight later she had pain in the right ear followed by discharge, and also in the left, which did not discharge. Condition at first examination: Right ear—Acute middle-ear suppuration, small perforation in postero-superior quadrant, no swelling or tenderness over mastoid. Left ear—Meatal canal very narrow, bulging of postero-superior wall, epithelial *debris* difficult to remove, but upper part of membrane seen to be inflamed. Tense red swelling over mastoid process tender to the touch. Temperature 103° F., pulse 130; tongue furred with somewhat prominent papillæ, no sickness, no rigors. Heart and lungs normal. On November 26, under chloroform, an incision was made over left mastoid down to the bone and pus evacuated. A carious opening was found in the bone at the lower and posterior part of the mastoid. This was enlarged and the outer surface of the mastoid removed. The sigmoid sinus was found exposed and there was a peri-sinusal collection of pus. More of the bone was removed and the sinus was further exposed in both directions. The upper part appeared healthy, but the lower part was collapsed and had a grey and sloughy appearance. It was slit open. Blood flowed freely from the torcular end, but there was only a very slight oozing from the direction of the bulb. Two days later, as the temperature rose to 105·4° F., and as the patient was very restless, the jugular was exposed in the neck, dissected up for a short distance, ligatured and divided. A week later oedema with tenderness appeared over the right mastoid; the temperature continued to show oscillations. The right tympanic membrane was inflamed and bulging posteriorly. It was incised. Temperature 105·6° F., nothing abnormal in chest. Twelve days later, December 17, the general condition showed improvement: the tongue was moist and clean; the left mastoid wound was satisfactory. There was, however, rather severe pain on pressure over the right mastoid. The discharge from this ear had ceased, but there was redness of the

canal and sagging of the postero-superior wall. The membrane was incised, and it was decided to explore the right mastoid. Some small granulations were found in the antrum. The mastoid process was hyperæmic, but otherwise healthy. The sigmoid sinus was exposed, but appeared healthy. From this period the progress towards recovery was uneventful. The wounds healed well; there is now no discharge from the ears, and the hearing is remarkably good.

Dr. THOMAS BARR complimented Dr. Love and Dr. Connal on the successful results in these two cases of lateral sinus thrombosis, and Dr. TURNER drew attention to the change in the attitude of otologists during the past few years as to the advisability of ligaturing the jugular. When the Otological Society of Great Britain met in Edinburgh several years ago, a discussion on this question took place and a good deal of difference of opinion was expressed. At the present time it seemed to be a very general rule to ligature the vein in cases of lateral sinus thrombosis. Though he knew that Drs. Dundas Grant, Moure and others had recorded cases where this procedure had led to bad results, he himself had not met with such cases.

Dr. STODDART BARR, in regard to the stage at which the ligature should be performed, said that no doubt if one could be sure that the sinus was involved the proper time would be before beginning the operation on the mastoid, but, as a matter of fact, the diagnosis was often in doubt till the sinus wall was exposed, so that in practice the usual method was to expose the sinus, and if after examination it was decided to open it, then before doing so to deal with the vein.

Dr. SYME referred to the results of an examination of over a thousand skulls. In a large number of these there was a marked difference in the size of the jugular foramen on either side, the left being usually much the smaller, and in a small proportion the size of the left was so much diminished as to be almost absent. In view of these facts he thought it might be wise to adopt a more guarded attitude towards ligature of the right than of the left jugular vein.

PATIENT SHOWING THE RESULT OF KILLIAN'S OPERATION FOR CHRONIC FRONTAL SINUSITIS.

By DR. R. FULLERTON.

Female, aged fifteen and a half years, complained of right frontal headache with tenderness on pressure over the right frontal region and inner angle of orbit. Discharge of pus into right nasal fossa. On examination pus was seen escaping from below right middle turbinal; no purulent secretion in left nasal fossa. At the operation the right frontal sinus was found well developed and extended well back over the orbit. The intersinusal septum was almost completely destroyed, and the left sinus, which was smaller, contained pus and granulation-tissue. No communication could be found between left sinus and left nasal fossa and none was made. The case seemed of interest because of the age of the patient and because of the absence of communication from what seemed to be the left sinus and the left nasal fossa. There is still a slight mucopurulent discharge in the left nostril, but not sufficient to give rise to any annoyance to the patient, and the headaches and tenderness have disappeared.

Dr. TURNER thought that probably in this case Dr. Fullerton had to deal, not with a pathological destruction of the intersinusal septum, but

with an accentuated anatomical irregularity in the relation of the two sinuses to one another. He had examined skulls in which one sinus encroached to such an extent on the other as to almost obliterate it, though complete absence of one sinus and of the naso-frontal opening was unlikely, as the frontal sinus developed from an upward prolongation of the nasal fossa.

PATIENT ON WHOM AN EXTERNAL OPERATION WAS PERFORMED FOR
SARCOMA OF NOSE.

BY DR. W. S. SYME.

Male, aged fifty-seven, first seen on May 1, 1909. History of nasal obstruction of some years' duration. Nasal polypi removed on several occasions. No pain, no epistaxis. On examination a pinkish mass was seen in the upper part of nasal fossæ, which tended to bleed on probings. On the left side of the nose there was a swelling, due, it was found, to absorption of the left orbital plate, and the left eye was pressed outwards. The right maxillary sinus was positive on lavage, the left negative. On transillumination the frontal sinuses were clear. The upper part of the septum was destroyed. The appearance of the growth suggested sarcoma and histological examination confirmed this, the pathologist reporting "small round-cell sarcoma, while some of the portions show the structure of simple nasal polypi." The eyes were examined by Dr. Inglis Pollock: "Disks congested, but no optic neuritis." On account of the nature and position of the growth it was decided to adopt Moutre's procedure. Under chloroform an incision was made down the middle line of the nose to the end of the nasal bones, then diverging to either side to the alar angles. The flaps were reflected and the cartilaginous portion turned down. Parts of the nasal bones and of the ascending portions of the maxillæ were clipped away, and a very good view of the interior was obtained, and the extent of the growth could be made out. Practically the whole ethmoid was involved, the vertical plate being destroyed as well as part of both lateral masses. The right antral cavity was invaded, but the left was free. The removal of the growth gave rise to a good deal of hæmorrhage in spite of the free use of adrenalin. The growth itself was evidently sarcomatous in the anterior and upper part, but posteriorly it gave the appearance of simple polypi. The sphenoidal sinuses were opened up and were healthy, except for what seemed to be simple polypi attached to the anterior walls. The external excisions were closed and the patient made a good recovery. For eighteen months there was no recurrence, but when seen on November 5, 1910, there was a suspicion of recurrence in the anterior part of the root of the nose, and in the region of the right fronto-nasal opening. The growth removed was again declared to be sarcoma. Though the frontal sinuses still illuminated well, it was decided to open them up. An incision was made over both eyebrows and across the root of the nose. The nasal bones were removed and a fairly extensive recurrence was found. The frontal sinuses were completely obliterated, the disease having extended into them. Since then the patient has done well, and the present condition is satisfactory.

Dr. CONNALL, discussing this case and the other cases of malignant disease of the nose shown, referred to a case he had exhibited in 1903 at the Glasgow Medico-Chirurgical Society. This patient had a large

sarcomatous mass attached to the external wall, floor, and septum. Intra-nasal methods were successfully adopted for its removal, and at the present time there was no recurrence. The histological examination showed that the growth was a spindle-celled sarcoma with an admixture of round cells. He had also recorded the case of a young lady whom he had similarly treated for myxo-sarcoma of the nose seven years ago, and in whom there was also no recurrence. Eight months ago he had operated on another case but it was too soon to speak of the result. In regard to carcinoma of the nose, however, his experience was that more radical methods were always necessary.

Dr. SYME said he was inclined to think that in regard to the question of an external or an intra-nasal operation the position and extent rather than the nature of the growth deserved consideration. In this patient an external operation was decided upon because it seemed impossible to eradicate the growth by intra-nasal procedures. On the other hand, more than two years ago he had operated on a lady for malignant disease of the nose—"rapidly growing carcinoma," was the pathologist's report—involving the ethmoid and sphenoid and extending into the antral cavity. The antral cavity was opened through the canine fossa and the sphenoid and ethmoid were attacked through the nose and by way of the antrum. There has been no recurrence.

TWO CASES SHOWING THE RESULTS OF OPERATION FOR CHRONIC FRONTAL SINUSITIS.

By DR. W. S. SYME.

(a) Male, aged thirty-three. Four years ago Ogston-Luc operation on right frontal sinus. Killian's operation on left. Caldwell-Luc operation on both maxillary sinuses. The ethmoidal cells and the sphenoidal sinuses were dealt with intra-nasally. There was a very large central cell at root of nose full of granulations. The after-treatment was troublesome owing to the tendency to the excessive growth of granulations. Ultimately a cure was obtained and there has been no treatment for two years. The frontal sinuses were exceedingly large, and to remedy the deformity which resulted from the operation paraffin was injected. The aesthetic result is good.

(b) Female aged forty-seven. Had disease of both sphenoidal sinuses, both ethmoidal labyrinths, and of both frontal sinuses. The sphenoidal and ethmoidal disease was treated by intra-nasal methods. Large development of sphenoidal sinuses with a large cell above and between the two sinuses. Four months ago Killian's operation on both frontal sinuses. On the right side the bridge was fractured. The purulent discharge has almost ceased, and there is very little deformity.

Dr. TURNER remarked on the number of cases of frontal sinus operation on the agenda. Lately a more conservative attitude had been adopted with reference to frontal sinus disease. Killian's operation was by no means so free from danger as it was at one time claimed to be, and he thought it should be adopted only after intra-nasal treatment had been given a prolonged trial or when urgent symptoms showed themselves. These cases should not be treated by general surgeons but only by those with special training in nasal surgery.

Dr. ADAM in this connection referred to several cases of fatality following operation on the frontal sinus of which he had knowledge.

Dr. FRASER asked if any member had had a fatal result after Killian's operation.

Dr. SYME replied that he had had one out of twenty to twenty-five operations for frontal sinus disease. This man had pan-sinusitis. The antral cavities had been operated on more than a year previously, and the ethmoidal and sphenoidal cavities had been dealt with as far as possible intra-nasally. Their condition was very bad. The frontal sinuses still discharged copiously and the man was in a most miserable and depressed condition, and it was only after repeated requests on his part that something should be done and after the risks were fully explained to him that it was decided to perform Killian's operation. First one side was dealt with and a fortnight later the other side was operated on. The fronto-ethmoidal region was found to be very much diseased and occupied by soft granulations. Death took place about a week later from purulent meningitis. Probably the danger in Killian's operation is in too thorough curettage of the ethmoidal regions. The operation on the frontal sinus itself, one would think, should be practically free from danger. So that it would be better to attack the ethmoid intra-nasally and cautiously, and to adopt Killian's procedure for the frontal sinus alone. One must remember, too, that whereas in many people a purulent nasal discharge, even long-continued, appears to cause little annoyance, in others it is attended with great discomfort and much depression of spirits, and though operation may be dangerous he would hardly agree that it should only be undertaken when serious symptoms supervened.

Dr. LOVE thought that one could get as good results from curetting the ethmoidal cells and draining the sinus as in most cases of external operation, and remarked that in two of the patients shown at the meeting there was still some discharge.

Dr. THOS. BARR urged that one should never neglect to warn patients of the risk before external operation was resorted to.

PATIENT WITH ANÆSTHESIA OF THE PALATE, PHARYNX, AND LARYNX, AND PARALYSIS OF THE PALATE, OF DOUBTFUL ORIGIN.

BY DR. W. S. SYME.

Female, aged forty-one, presented herself at the Glasgow Ear, Nose and Throat Hospital, complaining of difficulty in swallowing of one year's duration, with hoarseness at times. When first seen in January, 1911, she had anæsthesia of the palate, fauces, posterior wall of pharynx, and upper part of larynx. Since then other phenomena have shown themselves. Occasional regurgitation of liquids through the nose, and less frequently particles of food pass into the windpipe. During the past month she has become very giddy and her sight has deteriorated. Her present condition is as follows: There is anæsthesia affecting practically the whole of the soft palate (but not extending to the hard), the fauces, the central part of the pharynx, the base of the tongue, the upper part of the larynx, especially anteriorly. There is also paralysis of the tensor muscles of the palate, which hangs down limp. No other anæsthetic or paralytic phenomena can be made out. There is distinct vertigo, with a tendency to fall to left side. Both the patellar tendon reflexes are much increased, but there is no ankle-clonus or Babinski's sign. The tympanic membranes show changes associated with adhesive catarrh. There is no

history of aural suppuration, and the hearing is good. There is nystagmus on deviation of the eyes to the right, not in the opposite direction. The caloric reactions are interesting. Cold water in the left ear gives a quick and very active response, marked coarse nystagmus towards the right with very severe vertigo towards the left. On the right side the reaction is very much less marked, and almost no sense of vertigo is caused. The patient has optic neuritis. There is nothing important in the general history, and nothing to point to a heretic taint. Dr. Stockman has kindly examined the patient and has taken her into his ward. He has made a provisional diagnosis of cerebellar tumour.

There was an interesting exhibition of specimens, photographs, skulls, etc., contributed to by several members.

Dr. KERR LOVE brought before the society the claims of the *Votta Review*, the Journal of the American Association for the Teaching of Speech to the Deaf. The review is published at the Votta Bureau, an establishment founded by Dr. Graham Bell with money given him as a prize for the invention of the graphophone. In this connection the speaker reminded the meeting that the world owed the telephone to the deaf, for it was while searching for some means to aid his deaf wife that Dr. Bell discovered the telephone. The *Votta Review* reminded us that otology was greater than aural surgery, and that the brilliant results of operative work should not be allowed to exclude the fact of deafness and its consequences from the otologist's attention. Dr. Love also referred to a meeting to which he had been invited in London on June 9, which had for its object the foundation of a British National Bureau for the promotion of the welfare of the deaf. This Bureau was to be founded by a Mr. Bonn, who, deaf himself, was anxious to do something for the deaf as a class. The Bureau, Dr. Love understood, would be scientific rather than pedagogic in its aims, and it was probable that medical men would be represented on its council. He asked the society to allow him to convey to Mr. Bonn a message of its appreciation of his proposal. To this request the members readily and sympathetically acceded.

It was decided to hold the next meeting in Edinburgh in November, under the chairmanship of Dr. J. Malcolm Farquharson.

THE ROYAL HUNGARIAN SOCIETY OF PHYSICIANS IN BUDAPEST.—SECTION OF RHINO-LARYN- GOLOGY.

February 28, 1911.

President: Dr. A. ONÓDI.

Reported by Dr. A. LIPSCHER, *Secretary.*

TWO CASES OF FRONTO-ETHMOIDAL MUOCOCELE.

By Dr. M. PACNZ.

In a man, aged thirty-eight, and a woman, aged twenty-six, tumours formed in the right internal orbital angle above the upper eyelid, the

size of a hazel-nut, fluctuating and covered with healthy skin. The nose was healthy to appearance in both cases. After exploratory incision had demonstrated unmistakable distension of the frontal sinuses, the Killian radical operation was performed in both cases, with complete success. The author, influenced by the fact that in all the cases he had hitherto operated on signs of inflammation in the frontal and ethmoidal cells were clearly visible, is of opinion that it would be better to apply to this condition the name suggested by Killian—"sinusitis frontalis chronica cum dilatatione"—instead of the old appellation "mucocoele."

TYPHOID LARYNGITIS.

By DR. M. PAUNZ.

The patient was a man, aged twenty-one, the subject of typhoid fever complicated with inflammation of the lungs. At the onset of the fever, he suffered from hoarseness and later on also from difficulty in breathing. The author saw the patient three months after the onset of the typhoid fever. A swelling was seen below the level of the cords, which were slightly congested. The swelling was rounded and covered with inflamed mucous membrane. The lumen of the larynx was narrowed to the dimensions of two or three millimetres. There was great difficulty in breathing, with cyanosis. Widal positive. Acute submucous laryngitis was diagnosed and the presence of pus suspected. A low tracheotomy was performed, in the course of which the abscess burst, a considerable amount of pus escaping both through the tracheal opening and through the mouth. Subsequently intubation and dilatation of the constriction were carried out and with success. In typhoid fever laryngeal catarrh is common, and abscess and perichondritis are by no means rare. But submucous laryngeal inflammation with abscess formation is unusual and as a rule is not recognised at the time.

Dr. L. SIMKÓ said that the patient was now undergoing treatment with O'Dwyer's intubation tubes, and it was hoped that he would be able to leave the hospital without his tracheotomy tube. The vocal cords were still thickened and moved imperfectly.

TELANGIECTASIS AFFECTING THE MOUTH, PHARYNX, AND LARYNX.

By DR. J. SAFRANEK.

The patient was a male, aged twenty-six. The right half of the face showed dilated veins, and in the lateral region of the neck the veins showed through the skin as distinct bluish streaks. On the under-surface of the tongue the veins were enlarged to the thickness of a quill. On the dorsum near the tip the dilated vessels had formed two blood-spaces about the size of a bean. On the right side of the soft palate a network of dilated vessels was visible. On the alveolar process of the lower jaw there was a purplish swelling, about the size of a bean, composed of tortuous vessels, and a similar, but larger, tumour lay in the recess of the right pyriform sinus. No further changes were discoverable in the circulatory or other organs.

LUPUS OF THE LARYNX.

BY DR. J. SAFRANEK.

(1) A man, aged thirty-six, manifested typical lupus nodules, ulcers, and stellate cicatrices on the epiglottis, ary-epiglottic folds, ventricular bands, and in the subglottic region. The vocal cords themselves were healthy. The nose, throat and integument showed no sign of lupus. There was no pyrexia or other sign of tuberculosis. Tubercle bacilli were absent from the sputum. The case, therefore, was looked upon as one of primary lupus of the larynx.

(2) The patient was a male, aged twenty-nine. In addition to patches of lupus vulgaris on the skin of the nose and face the mucous membrane of the upper air-passages was extensively affected by the disease.

The cases were under treatment by Pfannenstiel's method.

Dr. E. POLLATSCHEK had found trichloracetic acid useful in such cases. The disease often lasted for years without getting any worse, and, as a rule, ran its course without causing any pain.

Dr. E. BAUMGARTEN some years before had demonstrated a case of primary lupus of the larynx in which tracheotomy had been found necessary. At a later date the patient became pregnant and abortion was induced. Considerable improvement followed without any local treatment.

EMBRYONIC CYSTS OF THE GUMS AND RETRO-PHARYNGEAL REGION.

BY DR. A. ONÓDI.

The author showed an eighth-month fetus with cysts in the gums and retro-pharynx filled with embryonic jelly. The retro-pharyngeal cyst was 10 mm. long, 13 mm. high, and 16 mm. broad.

THE RECESSUS FRONTALIS.

BY DR. A. ONÓDI.

In the anterior and upper part of the middle meatus of the nose higher up than the line of insertion of the middle turbinal, there is a well-defined hollow, the recessus frontalis. It forms the (? antero-inferior) region of the frontal sinus, and may also contain the orifices of some of the anterior ethmoidal cells. Ritter and Heymann look upon this recess—under the name of the infundibulum—as the deeper part of the hiatus semilunaris. Onodi, using the name in its older as well as in its more modern sense, includes not only the hiatus semilunaris between the uncinate process and the bulla ethmoidalis but also the hollow already mentioned, the recessus frontalis. The recessus frontalis may be absent and the frontal sinus may open into the recessus bullaris which lies above the bulla ethmoidalis; in one of his cases the frontal sinus opened indirectly into the middle meatus by opening into one of the anterior ethmoidal cells. The speaker demonstrated the relations of the frontal sinus to the recessus frontalis and to the hiatus semilunaris.

With Surgical Section.

March 16, 1911.

President: DR. P. KUZMUK.

THE EXPOSURE OF THE CRANIAL CAVITY AND BRAIN THROUGH THE NASAL ACCESSORY SINUSES.

BY DR. A. ONÓDI.

The speaker alluded to the statistics he had collected of 106 cases of brain abscess complicating suppuration of the nasal sinuses; 82 of these were secondary to frontal sinusitis, 11 to ethmoidal disease, 4 to antrum suppuration, and one was secondary to sphenoidal disease. Twenty-five cases of cured extra-dural abscess following frontal sinus suppuration were on record, and among these there was one case in which exploratory puncture of the brain had been performed with a negative result. In seven of these cases the posterior wall of the frontal sinus had been perforated and in eleven cases it was found to be diseased. In twenty of the cases of brain abscess the posterior sinus wall had been perforated and in fifty-seven of the cases it was diseased. In the majority of the cases the brain abscess was situated in the frontal lobe; three times it was found in the temporal lobe, once in the pedunculus cerebri and once in the cerebellum. Of these 106 cases of brain abscess 12 recovered as a result of operation and 29 died in spite of operation. Exposure of the cranial cavity through the ethmoidal cells in life had not yet been carried out.

Dr. Onódi described the methods by which the region of the pituitary body had been reached. There were two per-nasal methods which had been performed upon patients, namely that of Schloffer, through the ethmoidal cells after displacement of the external nose, and secondly, the endo-nasal route first performed by Hirsch. Hirsch had collected in all thirty-seven cases operated on, and to these Onódi added eight more. Eighteen of these forty-five cases had died. Hirsch had adopted the endo-nasal route in seven cases, and in six of these he had employed his perfected method of performing submucous resection of the septum so as to reach the anterior wall of the sphenoidal sinus and to expose the pituitary region by opening up the sphenoidal sinus. In five of his cases the operation was successful. The speaker mentioned also Kocher's modification of this operation which consisted in displacement of the nose, subsequent septal resection and opening up of the sphenoidal sinus. Hirsch's endo-nasal operation marked a great advance in rhinology. The speaker recommended both Hirsch's operation and Kocher's modification of it.

Dr. Onódi, by means of projected pictures, then demonstrated the topographical and surgical relations of the accessory sinuses to the cranial cavity and the brain. With reference to the puncture of the brain through the frontal sinus his researches showed that it should not be

performed more than 18 mm. above the level of the floor of the anterior cranial fossa, otherwise the needle might encounter the lateral ventricle or the basal ganglia. Below this level it is possible to insert the needle 4 or 5 cm. backwards and laterally. Abscess, when present, was usually situated in this lower region. On the convex surface of the anterior part of the frontal lobe in the neighbourhood of the frontal sinus the needle would enter the lateral ventricle and the ganglia if it were inserted 20 mm. above the base of the brain, and pushed backwards sagittally to a distance of 30-40 mm. For this reason the needle should not be pushed deeper than 2 or 3 cm. But if it were necessary for the needle to reach to the neighbourhood of the motor cortical centres—the pre-central convolution—or of the internal capsule, then it might be inserted at a point 4 cm. above the base of the brain, and passed in an upward and backward direction so as to reach the pre-central convolution, which lay some 8 to 10 cm. distant. The point described in brain surgery as the lower point for puncture lies 4 cm. above the middle of the supra-orbital margin. Only in a very few cases does this point lie in the neighbourhood of the frontal sinus. He had found only four cases out of 1200 skulls examined in which the frontal sinus extended upwards as far as this.

With reference to the operation on the pituitary body his investigations showed that the hypophysial eminence is not present in certain sphenoidal sinuses, and that the pituitary body is placed further back than the posterior wall of the sphenoidal sinus. In some cases the hypophysis is not encountered in the region of the sphenoidal sinus. Moreover, the sphenoidal sinus may be separated from the cranial cavity by a bony wall 10 to 12 mm. in thickness. He showed a preparation with a pituitary tumour and a strongly marked hypophysial eminence, and with a deep and broad sphenoidal sinus.

Dr. A. GYERGAI, in 1910, had demonstrated at the Congress of German Laryngologists, at Dresden, his procedure, which rendered possible the direct examination of the naso-pharynx and the most posterior parts of the nasal cavities, and the performance of operations without any preliminary operative steps. By his method it was possible, as he had demonstrated on the cadaver and in X-ray pictures, after removal of the inferior and superior walls of the sphenoidal sinus to reach the hypophysis.

Dr. B. ALEXANDER said that for the correct estimation of the relations of the frontal, ethmoidal and sphenoidal sinuses radiographs were necessary which rendered comparisons possible.

Dr. K. LANG thought that the endo-nasal exposure of the pituitary region, though capable of being precisely performed on the cadaver, was fraught with great danger when carried out during life.

Dr. J. SAFRANEK, although he agreed with the last speaker that the operation upon pituitary tumours by the endo-nasal route was difficult, nevertheless held that Hirsch's cases had proved that it could be carried out without much disturbance at the time of operation. As regards results, the endo-nasal method showed the same results as the other methods. In his opinion Hirsch deserved great credit for having worked out the endo-nasal operation.

Dr. OSÓRI, in reply, said that Hirsch's method was not applicable to all cases; in some Kocher's was the more suitable.

(D. M. trans.)

Abstracts.

MOUTH AND PHARYNX.

Sibley, W. Knowsley.—The Relation between the Teeth and certain Diseases of the Skin and Mucous Membrane. "Proc. Roy. Soc. Med.," May, 1911 (Odontological Section.)

Eruptions on the face, scalp and neck may be due to (1) irritation of one or more branches of the fifth nerve supplying the teeth, or (2) to toxæmia produced by absorption from unhealthy gums. The author states that pain from caries of the upper incisors is referred to the fronto-nasal area, and from the two upper bicuspids to the maxillary or temporal regions. In one case temporary patches of erythema under the eye disappeared after some carious teeth on the same side had been attended to. Local œdema of the face or buccal cavity may be the result of dental trouble, and simple or malignant ulcers of the mouth are frequently due to ragged teeth. The author also mentions leukoplakia buccalis and lichen planus as connected with dental disease.

J. S. Fraser.

Meyer, Arthur (Berlin).—Intra-nasal Extension of Hypertrophic Pharyngeal Tonsils. "Zeitsch. f. Laryngol., Rhinol., etc." Bd. iii, Heft 3.

As a rule "adenoids" do not extend quite as far forwards as the choanal openings, and therefore they can be completely removed by means of the curette. Occasionally, however, small prolongations extend forwards and upwards on the under surface of the sphenoid. In these cases after operation small tags, the size of a pea, may be seen on posterior rhinoscopy hanging down from the choanal roof. Meyer says these remains of adenoids may keep up turbinal swelling or purulent catarrh; they only occur in adults or older children and then only in cases of extensive "adenoids," and cannot be recognised before operation. Removal may be accomplished through the mouth with the aid of small curettes, a posterior rhinoscopic mirror and a palate retractor, or, better still, through the nose after the application of adrenalin and cocaine. Meyer records a case in a man, aged thirty-five, who had had adenoids removed; the intra-nasal extension was removed on both sides through the nose, and on microscopical examination showed the typical appearance of the pharyngeal tonsil; the nasal obstruction from which the patient suffered was completely removed.

J. S. Fraser.

Prota, Prof. G. (Naples).—Occlusion of the Hypo-pharynx by a Syphilitic Cicatricial Glosso-pharyngeal Diaphragm. "Archiv. Ital. di Laring.," Naples, 1911, p. 12.

The author contributes a valuable paper on this subject. In the case referred to, a youth, aged sixteen, had practically complete disuse of the pharynx, owing to the presence of a mass of cicatricial tissue, to which the anterior pillars adhered. Notwithstanding anti-syphilitic treatment and various attempts at dilatation from March to August last year, the stenosis increased until nothing could be swallowed and the patient had to be given nutrient enemata. Dyspnoea also occurred to such an extent

that in May tracheotomy had to be performed. Prof. Massei suggested gastrotomy, but the author tried incising the cicatrix with a pharyngotome, followed by dilatation with Bajeux's and O'Dwyer's tubes. The result was very satisfactory, and the patient can swallow well through the space gained, although this does not permit a view of the subjacent larynx or the œsophageal aditus. There are copious references to the cases of other writers as well as a useful bibliography.

James Douelan.

Duverger, J., and Bain, A.—A Rare Case of Lingual and Pharyngeal Sporotrichosis threatening Asphyxia. "Rev. Hebdom. de Laryngol., d'Otol., et de Rhinol.," April 15, 1911.

In this case of lingual and pharyngeal sporotrichosis the *Sporothrix Beauverii* was found on bacteriological examination, and treatment with a peroxide mouth-wash and iodide of potassium internally brought about a rapid cure. The paper concludes with a *résumé* of the characteristic features of "sporothrix stomatitis." The onset is insidious and probably very slow. All parts of the bucco-pharyngeal mucosa and even that of the larynx may be affected. The disease is characterised by the formation of ulcers, which are coated with a fetid material varying in thickness and resembling *papier mâché*. The bases of the ulcers, which may be either discrete or confluent, fungate and bleed readily. There is more or less infiltration of the mucosa, and this may give rise to considerable swelling of the tongue and pharynx. On the palate and pharynx are scattered whitish spots, which probably represent the ulcers in an early stage. The lesions are painless, and may be curetted without anesthesia. There is not often any glandular enlargement nor rise in temperature. Recovery is usually rapid.

John M. Darling.

NOSE.

Sieur and Rouvillois.—Anatomical Research on Puncture of the Frontal Sinus. "Rev. Hebdom. de Laryngol., d'Otol., et de Rhinol.," March 4, 1911.

Intra-nasal puncture of the frontal sinus has been recently advocated and systematically employed by M. Vacher. Encouraged by his work MM. Sieur and Rouvillois have revised the subject from the anatomical point of view. They approve of Vacher's instrument—a steel instrument with the double curve of the frontal sinus probe, point and convexity blunt, and with a saw edge on the terminal part of the concavity—and they recommend the following technique: The parts are anaesthetised with pledgets of wool soaked in 5 per cent. cocaine. The middle turbinal and meatus are carefully cleansed. The patient's head is held in the horizontal position by an assistant. The thumb of the operator's left hand gently raises the tip of the nose, the remaining four fingers being steadied on the forehead. The rasp is introduced, and the extremity carried along the angle made by the nasal bones and the septum until an obstacle is met with. The handle of the instrument is now lowered and the point directed outwards towards the upper and inner angle of the orbit. A continued moderate pressure will now carry the point into the sinus.

This procedure was carried out with success on the cadaver by the authors in twenty-four cases. They hold that it is possible to perform intra-nasal puncture of the frontal sinus, and they consider that clinically it would at least be a useful adjunct to removal of the middle turbinal and opening of the anterior ethmoidal cells in order to avoid acute retention while awaiting a convenient occasion to employ external methods.

John M. Darling.

Frankenberger, O. (Prague).—Ocular Disturbances in Diseases of the Nasal Accessory Sinuses. "Zeitschr. f. Laryngol., Rhinol., etc.," Bd. iii, Heft 3.

The author first refers to affections of the lacrymal apparatus caused by intra-nasal disease, and then goes on to discuss cases of orbital abscess due to rupture of an empyema of the sphenoidal, ethmoidal or frontal sinus. Case 1: Male, aged thirty-seven, had diminution of vision and diplopia for five months, left eyeball displaced outwards. Left ethmoidal bulla enlarged, left nasal cavity contained pus. Bulla opened with Hajek's hook, anterior ethmoidal cells opened up. The orbital displacement soon recovered. Case 2: Male, aged sixteen, suffered from swelling of eyelids on right side of four days' duration. Right middle turbinal swollen. Sondermann's suction apparatus removed a good deal of pus. The orbital abscess was at first incised and later the ethmoidal labyrinth was opened up and curetted. Case 3: Female, aged twenty-three, suffered from attack of coryza. Some days later sudden swelling of right eye; globe displaced forwards. Right middle turbinal polypoid with pus in middle meatus. Patient refused external operation and orbital abscess burst spontaneously. The middle turbinal was later resected and the ethmoidal region curetted. Both the ocular and nasal conditions returned to normal.

Passing to affections of the uveal tract the author notes that Zienn believes in a direct connection between sinusitis and iritis. Kuhnt, on the other hand, believes that sinusitis is only a predisposing cause; he has, however, seen opacity of the vitreous clear up after treatment of an atral empyema. Finally, in connection with affections of the retina and optic nerve the author gives a short account of Onodi's work, and states that if the wall of the optic canal be thin or dehiscant, suppuration in the posterior sinus may lead to perineuritis or to retrobulbar neuritis with limitation of the field of vision, amblyopia, central scotoma and amaurosis. As Hajek has shown, there may be pressure on the inner wall of the optic canal or on the veins from the sphenoidal sinus which have a collateral connection to those of the optic nerve. The author then gives a brief account of the cases recorded by ten writers. It is interesting to note that in several cases suppuration and even necrosis existed in the ethmoidal and sphenoidal cavities with little or no sign of it in the nose. Frankenberger records the case of a patient, aged twenty-eight, who had had nasal polypi frequently removed, and had suffered from severe headache since the last operation. Four days after there was sudden loss of vision in the left eye and the fundus was seen to be hyperæmic. The frontal sinuses and antra were normal, but there was pus and polypoid tissue in the left ethmoidal region. A radiograph showed a shadow in the left sphenoidal region. The middle turbinal was removed and the ethmoidal and sphenoidal sinuses freely opened up and

cured. They contained pus and polypi. Colour vision gradually returned, but a central scotoma for red and green remained on the left side. The case is not reported as "cured" because polypi and pus are still present in the nose.

J. S. Fraser.

Fabri, Dr. Elio (Florence). On the Action of Iodo-thiocinnamine on Exuberant Cicatrices of the Nasal Cavity. "Bolletino delle Mal. d'Orecchio, etc.," Florence, 1911, p. 80.

The author describes a very interesting case in which as the result of a severe accident extensive synechiae with almost complete occlusion had formed in both nasal cavities. Having cut with scissors the most prominent bands the surfaces were dressed daily with pledgets of gauze in iodo-thiocinnamine for twenty-four consecutive days. Cocaine was applied before each dressing. One c.c. iodo-thiocinnamine was given on alternate days by deep gluteal injection on forty occasions. An excellent result is reported. The author leaves it an open question how much of the success obtained was due to the local treatment apart from the injections.

James Douclan.

Arrowsmith, H. A Case of True Papilloma of the Nasal Septum. "Laryngoscope," February, 1911, p. 85.

The patient, a girl, aged twelve, had had left-sided nasal obstruction with some bleeding and soreness for a year. A small growth $\frac{3}{16}$ in. in diameter was found on the left side of the septum just behind the columnar cartilage. The growth was removed and on section found to be a papilloma. This is the thirty-fifth case that the author has been able to find recorded.

John Wright.

Freer, O. T. Sarcoma of the Nasal Wall of the Maxillary Antrum. "Laryngoscope," February, 1911, p. 98.

The patient, a woman, aged forty, was first seen in December, 1908, with a history of left nasal obstruction with bleeding and fetor for five months. A pink, lobulated growth was found filling the left side of the nose and naso-pharynx. This growth was removed intra-nasally without any great loss of blood with the author's per-nasal forceps. The turbinal bones and ethmoidal cells on that side were found to have been completely eroded by the growth. Six recurrences were removed intra-nasally from the naso-antral wall, and the patient when last seen had been free from recurrence for eight months. Histologically the growth was a mixed-celled sarcoma with extensive necrotic areas.

John Wright.

Metzenbaum, M. Submucous Resection, with a Description of the Author's Special Instruments. "Laryngoscope," February, 1911, p. 86.

The author advocates the administration of $\frac{1}{100}$ gr. of hyoscin hydrobromide half an hour before operation, and has found that by this means satisfactory anesthesia can be obtained by the use of as weak a cocaine solution as 2 per cent. applied locally. The special instruments consist of a chisel on the pattern of Ballenger's knife but with a fixed blade, and a pair of cutting pliers, the author being able to remove cartilage and bone in one piece by means of these instruments.

John Wright.

Carter, W. W.—Transplantation of Bone for the Correction of Depressed Deformities of the Nose. "Laryngoscope," February, 1911, p. 94.

The author has treated successfully three cases of depressed nasal deformity with loss of bone by autoplatic transference of bone. A piece of the ninth rib free from periosteum and about 2 in. in length is removed from the patient and a suitable piece of the outer compact layer split off and shaped. Through a transverse incision over the naso-frontal suture the skin and subcutaneous tissues are elevated with a thin curved two-edged knife and the graft inserted. The inserted fragments can be shown by the X rays to persist.

John Wright.

LARYNX.

Citelli, Prof. (Catania).—Intubation and Tracheotomy in Acute Laryngeal Stenosis in Children. "Zeitschr. f. Laryngol., Rhinol., etc.," Bd. iii, Heft 3.

This is a contribution to the old question, intubation *versus* tracheotomy. The author thinks that those who uphold one method only go too far, and that the operations are not really opposed—they are complementary; in fact, Citelli believes in the combination of both methods in many cases. In urgent cases of diphtheria the author believes in intubation, but says that in many cases this proceeding must be followed later by tracheotomy on account of stenosis of the larynx remaining after the disease has passed off. Tracheotomy is also indicated in cases of repeated spontaneous extubation. The most common cause of stenosis is swelling of the subglottic region with or without ulceration; if the tube be removed in these cases the dyspnoea recurs as a rule in a few hours, but it may not come on for five or eight days. In cases of chronic stenosis laryngotomy may be indicated, but Citelli advocates his own method—tracheotomy combined with the introduction of a small laryngeal tube through the tracheotomy wound. Citelli again calls attention to the fact that after tracheotomy stenosis is usually due to the incision having been made through the cricoid cartilage; this leads to subglottic cedema or to granulation-tissue formation. He narrates a diphtheria case in which tracheotomy was performed by another surgeon: after eight days the tube was removed, but had to be replaced. The tube was again removed, but the child soon began to have dyspnoea. On laryngeal examination Citelli saw a cicatricial ring below the cords at the lower border of the cricoid which had been cut at the operation; he treated the case by introducing an intubation tube, and only removed it fourteen days later: complete recovery.

In cases of stenosis following diphtheria, measles or typhoid, Citelli recommends intubation. The tube should be left in position for twenty-four hours. If symptoms recur the tube should be again introduced, and then tracheotomy slowly and carefully performed, the incision passing through the second and third tracheal rings; by this method the intubation tube can be introduced through the tracheal wound if necessary. In other cases in which the intubation tube is spontaneously coughed out on several occasions, it is advisable to perform tracheotomy at once. Finally, if the surgeon cannot remain near the case, both intubation and tracheotomy are indicated. By these methods laryngostomy with its troublesome after-treatment may often be avoided.

J. S. Fraser.

Blumenfeld, Felix (Wiesbaden).—The Pathological Anatomy of the Vocal Cords "Zeit. f. Laryngol., Rhinol., etc.," Bd. iii, Heft 3.

The author first describes a rare *post-mortem* specimen of carcinoma of the vocal cord. The tumour had extended in the antero-posterior direction, following the edge of the cord. Blumenfeld points out that epithelial tumours follow the lymphatics and that this accounts for the peculiar method of spread in cases of cancer of the true cord such as the one he records. The free border of the vocal cord consists of a tough elastic network covered with squamous epithelium. There are no glands and very little submucous connective tissue. Below the cords, however, and also in the region of the ventricle these structures are freely present. The lymphatic spaces of the vocal cords themselves are bounded above and below by the superior and inferior arcuate lines of Reinke, along which the fascia of the thyro-arytenoid muscle is attached to the cord. In the case recorded by Blumenfeld the boundaries of the tumour corresponded to these arcuate lines. Logan Turner has shown that the upper surface of the vocal cord can be injected, and that, if the pressure be increased, the subglottic part of the cord also becomes swollen, the same thing happens in the reverse order if the injection be made into the lower surface of the true cord. Most states that the lymphatics of the cord are very scanty and that they seem parallel to one another along the cord. The free edge of the cord cannot be injected. Blumenfeld states that rare cases are met with in which cancer of the vocal cord rapidly extends beyond the limits of Reinke's lines (which also correspond to the junction of squamous with cylindrical epithelium). As a rule, however, the growth extends round the anterior or posterior commissure to the other side, thus giving us the "ring" form of cancer. A similar ring-like spread of cancer is seen in the œsophagus and intestine, but it is never so circumscribed as in the case of the vocal cords. It is well known that cancer affecting the ary-epiglottic folds, the inter-arytenoid region, or the pharyngeal surface of the larynx is of bad prognosis because of the rich lymphatic system in these parts. Blumenfeld goes beyond Krishaber and divides cases of intrinsic carcinoma into (1) those affecting the vocal cords, and (2) those affecting the other intrinsic parts of the larynx. The latter are much less favourable, not only on account of the freer lymphatic circulation but also because the type of growth is different. B. Fränkel and others have operated successfully by intra-laryngeal methods on cases of cancer of the vocal cord. Blumenfeld believes that a case such as he has recorded would be suitable for this method. He also states that pedunculated adeno-carcinomata and cases in which only the free border of the epiglottis is affected are also suitable for endo-laryngeal removal. Finally, the author notes that the anatomical conditions to which he calls attention may be of importance in cases of laryngeal tuberculosis. The paper is well illustrated. *J. S. Fraser.*

Carter, W. W. An Unusual Case of Papilloma of the Larynx. "Laryngoscope," February, 1911, p. 102.

The patient, a male, aged forty-seven, had suffered from "croup" on several occasions as an infant, and also had warts on his hands. From the age of five his voice had been reduced to a whisper, and he suffered from dyspnoea on taking any active exercise. At intervals he coughed up small pieces of tissue "like cauliflower." His condition was looked upon as asthma until he reached the age of forty-five, when his larynx was examined and found to be almost filled with papillomatous masses, the

largest acting as a ball-valve. No treatment was employed until he came under the care of the author two years later with an acute attack of dyspnoea, which was relieved by steam and adrenalin inhalations. The growths, which grew from all parts of the larynx, including the commissures, were removed with a snare by the indirect method and the bases cauterised. When the case was shown the voice had not returned, and it was too soon to say if there would be a recurrence, but the author emphasised the length of time which the condition had persisted, and also the ease and safety with which the growths were removed with the snare.

John Wright.

Dencker, H. (Frankfurt-a-Main).—A Foreign Body in the Right Pyramiform Sinus simulating Tuberculosis or Tumour. "*Zeitschr. f. Laryngol.*," Bd. iii, Heft 3.

The patient was a man, aged fifty-one, who complained of pain on swallowing and hoarseness of six weeks' duration; cough and expectoration were also present, but the dyspnoea was slight. The cause of the trouble was unknown. Laryngoscopy showed marked oedema of the posterior wall of the larynx and of the right arytenoid region; the false cords were also swollen and the lumen of the larynx narrowed, so that the vocal cords could not be seen. Auscultation revealed only slight bronchitis. Dencker thought that tumour-formation or tuberculosis underlay the condition, and therefore removed pieces from the swollen arytenoid region for microscopical examination; the report, however, only stated "chronic subepithelial inflammation." Direct examination showed only swollen ventricular bands. One month later the patient returned complaining of a marked tendency to cough, and on laryngoscopic examination a yellowish-brown body was seen in the larynx lying in the sagittal direction. On removal this turned out to be a wooden peg used in preparing rolled herring. The patient then remembered that he had celebrated the Kaiser's birthday six weeks before his first visit, and had, along with a considerable quantity of alcohol, partaken of rolled herring. Dencker thinks the peg must have been in the pyriform sinus; if it had been in the ventricle the patient would have had more cough.

J. S. Fraser.

Evans, Arthur.—A Subsequent Report on a Case of Excision of the Larynx, Lower Part of the Pharynx, and Upper End of the Oesophagus for Malignant Disease (Squamous celled Carcinoma) of these Structures. "*Proc. Roy. Soc. Med.*," April, 1911 (Clinical Section).

The case was at first considered inoperable, but later Mr. Evans prevailed upon to attempt the removal of the growth. Details of the first operation were given in the "*Proc. Roy. Soc. Med.*" (Clinical Section) 1910, pp. 44-47. At the time of the second operation the patient had in the lower part of the neck a fistula, which showed a tendency to leak and caused discomfort. Mr. Evans closed this fistula and made a new one immediately below the hyoid, lining the walls of the new sinus by means of four skin-flaps. The new opening worked well, and seven months later the patient got married. She can now take a meal in a crowded dining-room without attracting observation, and can make herself understood in a forced whisper.

J. S. Fraser.

EAR.

Bárány, Robert. Temporary Depression of the Function of the Cerebellar Cortex after the Method of Trendelenburg, evidenced by the Pointing Test: Localisation in the Cerebellar Cortex. (Preliminary communication.) "Monats. f. Ohrenh.," Year 45, No. 3.

At the Physiological Congress in Vienna, 1910, Trendelenburg had demonstrated his method of non-injurious inhibition of the cerebral cortex by the agency of cold, normal saline solution at -7° being used. By this means the temperature of the dura was reduced to $+12^{\circ}$, the solution being allowed to flow through a rubber bag applied over the desired area. Dr. Kollmer had suggested that this method should be adopted in experimental research on the cerebellum of animals. It had thus occurred to Bárány that, as it was impossible to carry out his pointing tests on animals, and as the temperature of the dura could be lowered to $+12^{\circ}$ with impunity, this method might be used on man without danger, especially if the temperature were not reduced so low but were applied longer, and he had carried out investigations on these lines on patients in whom a large area of the cerebellar dura had been exposed, as often occurred after labyrinth and sinus operations. As regards the result of these tests on cases which had been subjected to the labyrinth operation, he could state theoretically what would be the direction of the pointing, if, indeed, any response at all occurred. The patient with a healed, right-sided cerebellar abscess whom he had shown at the Austrian Otological Society, whilst in the acute stages of the disease, had pointed to the right with the right arm; later on a deviation to the left with the same arm was observed. Also the other patients, in whom severe degrees of deafness existed in combination with symptoms of cerebellar disease, had all shown spontaneous deviation outwards when their pointing reaction was stimulated, whilst after rotation or syringing the deviation to the left was absent. From this Bárány had concluded that the centre for the inward movement must lie in the surface of the cerebellum immediately behind the labyrinth, and thus if one were able to inhibit this centre by cold-water irrigation then deviation outwards must be the result. Repeated investigations carried out by him on two cases, in which the labyrinth operation had been performed, resulted in the deviation of the arm and leg outwards on the operated side if the meatus on the same side were irrigated, whilst no effect took place on the opposite side. In addition the sound ear was next irrigated with cold water, which gave rise to a nystagmus directed towards the operated side and deviation of both upper extremities towards the sound side. Afterwards the ear on which the labyrinth operation had been performed was similarly treated, when, as he had expected, the arm of the sound side and of the opposite side deviated outwards. Although these tests confirmed his theoretical expectations yet he could not unreservedly accept their accuracy. The deviation did not follow with the mechanical promptness one saw in the labyrinth tests and the degree of the deviation was only slight, so that further investigations must be carried out in order to establish their true value. He had attempted to adduce further corroborative evidence by endeavouring to produce other deviation effects through action on other areas of the cerebellum. To this end he had applied water at 10° to two patients in whom, after operations on the lateral sinus, the posterior fossa had been exposed and in whom already healthy skin had covered the underlying dura. No constant results, however, were obtained. Deviation inwards

of the arm and leg on the operated side was, indeed, repeatedly noted—that is, in an opposite direction to that which was observed during the earlier tests on those patients in whom the labyrinth operation had been performed—but the reaction was not constant and was only of a slight degree. This may have been due to the intervention of the comparatively thick scar-tissue. The object of the test was to determine the localisation of the various centres in the cerebellar cortex for the various directions of deviation by means of localised application of cold. It would be most important to investigate on these lines those cases in which a growth was to be removed, and thereby to test the function of the area thus exposed when the bone had been resected just before the second portion of the operation on the cerebellum itself.

He would reserve any further remarks until he had extended his research in this direction.

[It is very unfortunate that some most important data have apparently been omitted, as this is an almost verbatim report of the paper, and the account of continued research in this direction will be awaited with great interest. As regards my own very limited experience of such tests, the main feature of the results of cold irrigation of the meatus, carried out on cases in which the cerebellum was presumably healthy, has been an outward deviation of the upper extremity on the side under observation, that is, in a direction opposite to that of the nystagmus so induced. The normal physiological reaction must be first determined and *post-mortem* evidence obtained before inference of any value can be deduced from the results of these tests in cases where disease is present.]

Alex. R. Tweedie.

v. Stein (Moscow).—Giddiness: Autokinesis Externa et Interna: New Function of the Cochlea.

[The following is chiefly a translation of Goerke's notice of v. Stein's book in the "Zentralbl. f. O.," February, 1911.]

The substance of the book is a *résumé* of v. Stein's numerous and elaborate researches, physiological and clinical, during ten years, into the functions of the labyrinth: in addition it includes an exhaustive bibliography and general review of the literature of the subject. The author begins with a historical account of the various definitions of "giddiness," and divides the various abnormal states of sensation of movement into two classes: (1) The sensation of the movement of external objects about the percipient (autokinesis externa); (2) the sensation of movement of the percipient's body, which is in reality stationary (autokinesis interna).

Both forms need to be analysed as regards their plane and direction of movement, and the nature of the movement, whether vibratory, pendulum, circular, etc., as well as their duration, speed, and relation to alterations of position. For the determination of these points v. Stein has invented a number of special tests (autokinometer, photokinometer, colour experiment), in addition to the application of better-known methods, and especially the investigation of objective disturbances of equilibrium ("Statik" and "Dynamik"). Throughout the book great emphasis is laid on the last method.

In the investigation of disease of the labyrinth it has to be determined whether there is complete destruction of the whole organ, complete destruction of a single part, ampullary crest or macula, partial interference with function in the labyrinth, disease of the eighth nerve and ganglia, or finally of the central nuclei. We have at our disposal, in

addition to the determination of hearing, objective and subjective disturbances of equilibrium. In the former category we have disturbances of co-ordination in single muscles, muscle-groups, and especially in the muscles of the lower extremities, which the author considers to be of fundamental importance. The eye-muscles afford significant evidence in the diagnosis of labyrinth disease by the occurrence of nystagmus. Among the large variety of causes of nystagmus special importance attaches to the rotatory tests, less in the author's opinion to the thermal tests, while electrical stimuli afford no sure grounds for conclusions. In v. Stein's view the muscles of the body at large are almost as intimately influenced by the labyrinth as those of the eyes, each group having its special organ in the labyrinth: the presence or absence of function with regard to the ocular muscles is apparently in his opinion quite inadequate evidence of the functional condition of the vestibular apparatus.

Subjective disturbances of equilibrium (autokinesis) require the application of a force of given magnitude (movement in straight or curved path) to bring about their occurrence in the normal; they include sensations of motion of the subject and of objects about the subject.

The physiology of autokinesis, its causation, and the locality in which the sensations arise is next discussed. All experimental and clinical observation agrees that the labyrinth is the locality of origin, not the brain. Within the labyrinth v. Stein is strongly of opinion that the sensations arise in the cochlea and not in the vestibular section. This opinion seems to be largely based on the absence of known paths of connection between the vestibular nerve and the cerebrum, while those of the cochlear nerve are well known. The reflex muscular movements and inco-ordinations are derived from the vestibular part, the sensory disturbances from the cochlea. He finds a physiology for this by the streaming of endo-lymph during rotation through the canalis reuniens into the ductus cochlearis, producing a bulging of the flexible Reissner's membrane. Centrifugal force at the same time produces a pressure on Corti's membrane and the hair-cells. v. Stein elaborates a theory for the origin of the various labyrinthine sensations by this means, and in this way localises the origin of giddiness in the cochlea.

The disturbances which follow injury or destruction of the labyrinth are ingeniously ascribed by the author to the withdrawal of those constant effects on the labyrinthine nerve-endings which are due to gravity and the centrifugal force of the earth's motion, to which the organism is adjusted, the reflex effects originating in the vestibular parts, the sensory in the cochlea. He regards the majority of the "traumatic neuroses" as the expression of a traumatic damage or concussion of the labyrinth.

Besides the function of hearing, v. Stein thus ascribes to the cochlea a long and varied list of sensory functions, which include, of course, those usually accepted as labyrinthine, and also such varied activities as the recognition of barometric changes, influence on cutaneous sensibility, influence on a number of spatial sensations, influence on nutrition and colour-fields in the eyes, etc.

At first sight much in these conclusions has the appearance of being the product of a fanciful imagination. The whole matter is, however, worked out with method and on an experimental basis, and whatever conclusion is arrived at, the author's views demand serious and attentive consideration. The main object of the work is stated by the author to be to protest against the disuse of those general investigations of the muscular system which he has always advocated in the past as essential in disease of the labyrinth, and to warn the younger generation that the

hasty diagnosis of affections of the labyrinth is often rendered impossible by the complexity of the labyrinthine functions.

C. E. West.

Clayton, M. Brown (Vienna).—The Influence of the Radical Mastoid Operation upon the Functional Activity of the Labyrinth and the Acuteness of Hearing. "Arch. f. Ohrenheilk.," Bl. lxxx, Heft 1 and 2, p. 106.

Twenty-nine cases were examined according to the accepted methods before and after operation. The following are some of the results obtained:

(1) Of the cases in which before operation the hearing ($\frac{1}{2}$ for whisper) was from 0 to 5 metres, 30 per cent. showed improvement after healing of the wound; 10 per cent. remained as before, and 60 per cent. became worse.

(2) Of the cases in which the hearing before operation was from 6 to 9 metres, 50 per cent. improved and 50 per cent. became worse.

(3) Of the cases in which the hearing before operation was 10 metres or more, 14 per cent. improved, 14 per cent. remained unaltered, and 72 per cent. became worse.

These results bear out the opinion, generally held, that post-operative improvement occurs more often when the hearing is considerably reduced than when it is only slightly reduced. It should be noted, however, as the results here reported show, that if we take the cases as a whole the hearing oftener becomes worse after operation than it was before.

With regard to the question as to whether it is possible to foretell from the hearing and vestibular tests what the prospects are likely to be after operation, the following results were obtained:

(1) Cases in which the *hearing remained unchanged* after operation: In all there were few or no signs of intra-labyrinthine impairment or degeneration, cochlear or vestibular, prior to the operation.

(2) Cases in which the *hearing improved after operation*: The results of testing suggest that improvement may be anticipated if the upper tone limit is little or not all lowered; if the vestibular reactions are normal or nearly so; if the aerial conduction of tuning-fork *a* is normal or only slightly reduced.

(3) Cases in which the *hearing became worse after operation*. Deterioration is to be looked for when, before operation, the hearing for tuning-fork *a* is moderately lessened; when there is some lowering of the upper tone limit; when concomitant disease of the semicircular canals exists.

(4) Cases in which *severe deafness followed operation*: Severe deafness after operation is most likely to occur when the hearing for the lower tones is seriously affected and when before operation the hearing for higher tones is degraded; when the perception of tuning-fork *a* is much impaired; when the vestibular symptoms and reactions betoken grave interference with this part of the labyrinth. Curiously enough it was found that in these cases the severity of the cochlear affection after operation was not accompanied by a corresponding loss of the already impaired vestibular excitability, a finding which seemed to show that the vestibular nerve is more resistant to post-operative degenerations than the cochlear nerve.

The reliance to be placed upon these conclusions is shaken when we learn that it was found that the amount of deterioration of hearing after operation may be quite independent of the state of the function before operation.

Dan McKenzie

REVIEW.

New and Non-Official Remedies, 1911. Chicago: Press of the American Medical Association, 1911.

By a very happy inspiration a council of pharmacy and chemistry was established in February, 1905, by the American Medical Association for purpose of gathering disseminated information for the protection of the medical profession and the prescribing of proprietary medicinal articles. The work now before us contains descriptions of the articles which have been examined by this council, and it will certainly be admitted by even the most pushing of drug manufacturers that the subject has been dealt with in a large-minded and catholic spirit. We can scarcely think of a drug with an artificial title which is absent from this book either under its trade name or its true chemical one. In the body of the book, which is alphabetically arranged, we certainly miss anæsthesin under that name, but in the index we are referred to its full-dress title of ethylaminobenzoate. In addition to the list of new and non-official remedies which from their descriptions, usefulness, title and mode of advertising, the council fully approves, there is an appendix containing proprietary articles arranged under the names of the manufacturers or their agents, which, though complying with the rules, do not seem to possess sufficient originality to be admitted to the body of the book. Among these we observe agar-agar combined with cascara sagrada under the denomination of regulin. It is interesting to observe the numerous names applied by different manufacturers to the agents extracted from the supra-renal bodies. The day has gone by when proprietary remedies are placed under a ban, and the practitioner will find it of great advantage to have this more or less official guide to the selection of new and non-official remedies.

Dundas Grant.

THE NATIONAL BUREAU FOR PROMOTING THE GENERAL WELFARE OF THE DEAF.

At a meeting held on June 9, 1911, at 22, Upper Brook Street, London (the house of Mr. Leo Bonn), it was decided to inaugurate a bureau, as above, for the following purposes:

To get into touch and co-operate with all existing agencies and charities for the improvement of the deaf and to consider the question of overlapping. To collect all information available from annual reports, periodicals, daily papers, government publications—home and foreign—and to classify such information and to keep it available for members of the Bureau. To make special studies of any problem affecting the deaf which may recommend itself for the purposes of investigation, and to submit the results of such investigation to the Council for the purposes of public and private propaganda of suggestions or reforms.

The Bureau will be established in London, and its management will be vested in a council and an executive committee, among the members of which we observe the names of Dr. Kerr Love and Mr. Macleod Yearsley.

We understand that Mr. Bonn has generously offered to establish and maintain the undertaking for two years.

THE
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CARCINOMA OF THE NASO-PHARYNX IN A GIRL, AGED SEVENTEEN.

BY THOMAS GUTHRIE, M.B., B.C., F.R.C.S.

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Liverpool County Hospital for Children; Clinical Assistant,
Throat Department, Royal Infirmary, Liverpool.

THE patient, Mary S—, aged seventeen, was sent on April 17, 1911, to the Liverpool Royal Infirmary, by Dr. W. Allison Dunn, of Millom, Cumberland, to whom I am indebted for much information with regard to the subsequent history of the case, which I had an opportunity of examining on one occasion only.

The chief symptoms, when I saw the patient, were those of nasal obstruction and pain. There had been complete obstruction of the left nasal passage for some three or four months, and partial obstruction of the right for about one month. Pain, at times very intense, had been present for about five weeks, and was felt mainly in the left side of the face and the left ear. There had been occasional slight spontaneous hæmorrhage from the left nostril, and several "attacks of unconsciousness" of uncertain nature had been observed. Loss of hearing of the left ear had been noticed for a fortnight.

On examination, a mass of enlarged, firm, and rather fixed glands was present on the left side of the neck behind and below the angle of the jaw and extending beneath the sterno-mastoid

muscle. There was slight uniform swelling of the left cheek. The left half of the soft palate was bulged downward and forward. A little air could still be blown through the right nostril, but obstruction of the left nasal passage was complete. After removal from the left nasal cavity of a quantity of muco-purulent secretion, a mass of dark red colour and bleeding readily was seen filling the extreme posterior part of the cavity, the remainder of which was normal. Removal of a small portion of this mass for microscopic examination was followed by free bleeding. With a finger in the naso-pharynx a firm but not excessively hard mass was felt occupying the greater part of the space and continuous with its posterior wall immediately above the free margin of the soft palate. The left maxillary antrum was dark on transillumination while the right was translucent. A subacute suppurative otitis media was present on the left side.

The case was clearly one of malignant disease—probably sarcoma—originating on the left side of the naso-pharynx. It appeared probable that the growth had extended into the left spheno-maxillary fossa and invaded the antrum through its posterior wall, while secondary deposits were present in the left upper cervical glands. Operation was out of the question and the patient returned home.

The specimen which I removed was examined at the University laboratory and the first report described the growth as a "typical squamous-celled carcinoma without cell-nests." Dr. Ernest Glynn, however, kindly re-examined the section for me later, and reported that "it is not an epithelioma, for there are no cell-nests and no trace of prickly-cells. . . . In my opinion the growth would be more accurately described as a spheroidal-celled cancer of the medullary type."

In answer to my inquiry as to the subsequent progress of the case, Dr. Dunn wrote on May 24 that "the growth has continued to extend rapidly, and there is a marked increase in the size of the glands on the left side; the left ear has been pushed outwards. There is also an enlargement of the glands on the right side of the neck. The left eye shows increasing exophthalmos, but the mobility of the eye is as yet not interfered with. Vision is not yet affected, but strong light causes pain in the left eye. Pain is constantly present in the left eye and left side of face, especially at the mental foramen. There has been no considerable spontaneous hemorrhage, but there is a slow oozing of blood into the naso-pharynx. The attacks of unconsciousness disappeared

and have not returned for over three weeks; I could never ascertain their cause." On July 16, I heard from Dr. Dunn "that the case is still progressing, and I am afraid she cannot live much longer. There is now well-marked exophthalmos of the left eye, and for the last month she has not been able to see with it, and cannot distinguish light from darkness. There is constant pain present over the left orbit and behind it. There is now continued discharge from the left ear, which is pushed outwards by the increasing swelling. She cannot now eat any solid food owing to difficulty in swallowing. There is also daily hemorrhage from the nose, and she is getting gradually weaker."

It is generally recognised that carcinoma of the naso-pharynx is a rare disease, and it is interesting to note that Moritz Schmidt, in a total of 32,997 cases of disease of the nose and throat, met with none of naso-pharyngeal carcinoma. In the nasal passages he found carcinoma in five cases, and in the oropharynx in sixteen. In the year 1905, F. Laval could find in the literature only twenty-seven cases of cancer of the naso-pharynx, but the number must now be considerably greater, as Compaired, of Madrid, has himself reported several cases and does not regard the disease as extremely rare. Nevertheless by most writers the condition is still looked upon as a very exceptional one, sarcoma being of course relatively common.

In one half of the cases collected by Laval the patients were between forty and sixty years of age, and of the remainder only three were under the age of thirty, one of them reported by Edler being fourteen, another reported by Jackson twenty-three, and the third twenty-eight. The oldest patient was sixty-eight. So far as I have been able to examine the literature in reference to cases reported since the year 1905, the date of Laval's paper, I have found none under the age of thirty. The case therefore which forms the subject of this paper appears to be the youngest hitherto recorded with the single exception of that observed by Edler.

As to the type of cancer met with in the naso-pharynx, definite information is somewhat difficult to obtain. Of the cases collected by Laval, thirteen were described as "carcinoma," and the remainder as "epithelioma," among the latter being one or two of "scirrhus." Primary squamous-celled epithelioma of the naso-pharynx of course presupposes a preliminary metaplasia of the cylindrical-celled epithelium, and is therefore likely to be of less frequent occurrence than other forms of carcinoma in this situation. Hence the description of many of the cases as "epithelioma" is

probably not to be taken as indicating that the cells were of the squamous variety.

The course of the disease differs but little from that of sarcoma. It is said that bleeding is less frequent and that the lymph-glands begin to enlarge later, but in our case marked glandular enlargement was present at an early stage, and hæmorrhage, although never large in amount, has been a quite definite feature of the case. Mickulicz, in his article in Heymann's "Handbuch"; states that while sarcoma tends to tumour-formation and obstructive symptoms, carcinoma is characterised by disintegration and early destruction of neighbouring structures. This distinction certainly appears to be applicable to a majority of the cases described, but in ours tumour-formation was considerable and nasal obstruction one of the first symptoms.

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ON EVISCERATION OF THE TONSILS.

By C. G. RUSS WOOD, F.R.C.S. ENG., L.R.C.P. LOND.,
Surgeon to the Eye, Ear and Throat Hospital, Shrewsbury.

DURING recent years enucleation of the tonsils has been extensively practised, and to a great extent has displaced the older operation of tonsillotomy, no doubt in many cases with advantage. But all new methods which are taken up with enthusiasm tend to overshadow older procedures, which sometimes thus fall into undeserved oblivion. When tonsillotomy has been performed, it is sometimes completed by breaking up the substance of the tonsil with the finger, and it is to this procedure, somewhat elaborated, that I wish to draw attention.

The drawbacks to enucleation of the tonsils are, the time occupied by the operation, necessitating either chloroform or ether anaesthesia; the occurrence of severe hæmorrhage, which not infrequently takes place after the tonsil has been removed from its

fossa; and the length of time the patient has to stay in bed after the operation, which, in a hospital where the beds are limited, is an important matter. Its great advantage is the thoroughness of the removal of the diseased gland.

The operation to be described, which may be termed "evisceration," is, I think, the preferable procedure in the majority of cases. Among its advantages are, that it can be easily performed under nitrous oxide anaesthesia, and the small amount of hæmorrhage, so that risk of blood passing into the larynx is obviated; the bleeding is less than that which occurs after an ordinary tonsillotomy, and compared to that which takes place after enucleation, negligible. Also the patient can return home as soon as after the operation of tonsillotomy. It is especially applicable to that form of chronic tonsillitis which is entirely within the faucial pillars and does not project towards the middle line: at the same time the supra-tonsillar fossa is well opened and cleared out.

The procedure which I generally adopt is as follows: The patient lies supine on the table, and a Doyen's gag having been placed between the teeth, nitrous oxide anaesthesia is induced; when complete the gag is fully opened by an assistant, tonsillotomy is quickly performed, and the guillotine put aside. The surgeon's right thumb is now placed behind the angle of the jaw on the patient's right side and the forefinger of the same hand in the corresponding position on the left side. The finger and thumb thus grasp the neck just below the mandible, pressing both tonsils well inwards. The forefinger of the left hand is now passed into the mouth, and the tonsils are broken up in succession, beginning in the supra-tonsillar fossa and rapidly working downwards, firm counter-pressure meanwhile being made by the finger and thumb of the right hand. The glands easily come away as a thick grumous fluid. The patient is then quickly put into the sitting position and expectorates the broken-up tonsils into a bowl. It is quite unnecessary to remove a large piece of the tonsil with the guillotine, merely opening the capsule is sufficient. In children under eight years or so it is frequently not necessary to use the instrument at all, because the tonsil capsule can be easily ruptured by pressure of the finger. If there have been many attacks of tonsillitis the glands are firm and too fibrous to permit evisceration to be carried out efficiently, and enucleation should be performed. But this is not invariably so, because some months ago I advised the removal of two very large tonsils in a young man of twenty-four; the right tonsil I enucleated, but the hæmorrhage was so

profuse that I decided to eviscerate the left, in spite of knowing it was very fibrous in texture from repeated attacks of tonsillitis. This was carried out accordingly, and on seeing him two months later it was not possible to say on inspection which tonsil had been enucleated and which eviscerated.

I have carried out this method on over 700 patients and have never seen any ill-effects follow. Within twenty-four hours the tonsillar fossa is filled up with inflammatory exudation within the gland-capsule, but this entirely disappears in a week or so; at the same time there is no more post-operative odynphagia than after an ordinary tonsillectomy.

Possibly immunity from unpleasant after-effects is in part due to a measure which I have for many years always carried out in connection with tonsil operation cases; it consists in giving calomel, gr. $\frac{1}{10}$, in a sugar pilule, and the patients are instructed to suck one every five minutes; these are given about two to three hours after the operation and repeated in the morning for the following three days. Children of six years are given about seven pilules, those of twelve or fourteen the same number as they are years old, and adults sixteen to eighteen. The calomel seems to have a local antiseptic action on the throat, and a remote one by opening the bowels to some extent. This method of administering calomel was advised by Dr. Dewar¹ some years ago in acute tonsillitis and he suggested its use after these operations. Being made up with sugar children take them easily, and I find these pilules are far superior to formalin lozenges. The usual after-treatment of tonsillectomy is carried out as well, but there is no need to enter into these well-known details.

With regard to this method, the advantages are the ease with which it can be carried out under nitrous oxide anaesthesia, the freedom from troublesome hæmorrhage, and the effectual clearing out of the supra-tonsillar fossa. For these reasons I suggest evisceration as a procedure which is worthy of consideration in many of those patients whose tonsils are chronically enlarged and require operative interference.

¹ *Brit. Med. Journ.*, November, 1900.

TREATMENT OF PULMONARY TUBERCULOSIS, DISEASED LACRYMAL DUCTS, CATARRHAL OTITIS MEDIA, HAY-FEVER AND CHRONIC ASTHMA NOT COMPLICATING HEART DISEASES.

BY CHARLES AUBREY BUCKLIN, A.M., M.D. (New York).

THE author is convinced, by a large clinical experience, that the majority of cases of pulmonary tuberculosis can be cured by choosing for the patients conditions favourable to the cure of bronchitis. These conditions are obtained by elevating the "atmospheric relations," that is, diminishing the difference between external and internal atmospheric pressures during inspiration, so that while residing at home the patient will be subject to the conditions prevailing at an altitude of about 15,840 ft., or three miles.

This alteration of atmospheric relations is realised by the removal of one fourth of the most prominent lower turbinated bone. (Deformities of the septum require no attention providing free nasal inspirations can be obtained without removing them.) This favourable condition for the cure of chronic bronchitis¹ having been established, it only remains to eliminate the tubercle bacilli from the patient.² These bacilli can be destroyed by resorting to a forced diet such as milk—a tumblerful of pure³ sterilised⁴ milk being given to the female every forty-five minutes for twelve hours, and an equal amount being given to the male every thirty-six minutes for the same length of time, the milk being taken ice-cold, or from a sterilised bottle sealed air-tightly. To one quart of the milk there are added four drachms of dilute hydrochloric acid, one half of this mixture being given at the commencement of the twelve hours, and the other half being the last food given during the day. The addition of hydrochloric acid not only assists digestion, but also ensures that plastic exudation shall be much more liberally and quickly thrown out in the lungs, as is necessary for obliteration of the cavities existing therein.

¹ *Archives of Otology*, vol. xxxvi, No. 4, 1907, Case No. 3, p. 409.

² *Ibid.*, vol. xxxvi, No. 4, 1907, Case No. 1, p. 407.

³ The milk must be so rich in cream that $\frac{2}{3}$ in. to $\frac{3}{4}$ in. of cream will appear on $\frac{1}{4}$ oz. of milk standing in an ounce test-tube in the living-room for twelve hours.

⁴ To sterilise the milk, the uncorked bottles of milk are lowered in dry metallic pails into a wash-boiler containing boiling water, which has been removed from the fire, the water being at such a height that it cannot enter the dry metallic pails. The cover is placed on the boiler, and the milk is allowed to remain for twenty minutes; the temperature is thus raised to 75° C. or 167° F. The milk is then kept cool, or it is sealed air-tightly in bottles until consumed.

One teaspoonful or more of fresh castor-oil is given in hot black coffee upon retiring nightly for the purpose of ensuring an open alimentary canal, which is necessary in treating pulmonary tuberculosis.

The average time required in New York for the cure of pulmonary tuberculosis does not usually exceed eight months. The case is cured when the tubercle bacilli have disappeared, the cough has ceased, and the patient has gained from 30 to 60 lb. in weight. The author believes that the average time required in London is much longer. The only case treated here by the author required eighteen months to produce a cure.

Complications do not prevent the patient from being cured. The only unfortunate condition is a poor digestion.

Diseased lacrymal ducts¹ can be cured, according to the author's experience, by simply amputating one fourth of the lower turbinated bone on the affected side. With pliable probes passed through metallic tubes, so curved that the direction of the point of the probe is shifted through a right angle, the author has demonstrated on the cadaver that they are as effectively used through the nasal end of the lacrymal tube as through the ocular end. Less pain is caused by probing the nasal end of this tube, and no deformity results from this operation.

The majority of cases of catarrhal otitis media² under twenty-five years of age can also be cured by the same elevation of atmospheric relations; this entails the cure of the hypertrophic nasal catarrh existing in all of these cases.³ Further treatment will not be required.

The cure of hay-fever and chronic asthma not complicating heart diseases, can be attained in the majority of cases by altering the atmospheric relations equivalent to an elevation of about 31,680 feet, or six miles. For this purpose it is necessary to remove one fourth of both lower turbinated bones. The operation is required when both lower turbinated bones are so prominent that with their coverings swollen they obstruct both nostrils. In hay-fever the amputation of so large a surface of sensitive tissue is an important element in the cure of this disease. The above-described "atmospheric relations" can be indicated by experiment made with the "respirometer."⁴

¹ *Archives of Otolaryngology*, vol. xxxvi, No. 4, 1907, Case No. 7, p. 410.

² *Ibid.*, vol. xxxvi, No. 4, 1907, Cases Nos. 5, 6, p. 409.

³ *Ibid.*, vol. xxxvi, No. 4, 1907, Case No. 4, p. 409.

⁴ The least height to which water has been raised in the "respirometer" by

After sufficient clinical experience with every method ever used for the removal of the lower turbinated bones, the author recommends his nasal saw of 1905¹ as the only satisfactory means of accomplishing these operations. This saw consists of a reversible blade 6 in. in length with $3\frac{1}{2}$ in. of teeth, twenty to the inch, so set that they only cut upon withdrawal; this obviates the liability of the saw to buckle. These teeth are set in imitation of those on the butcher's saw. Skilled hands only require, with this saw, five seconds to amputate the lower turbinated bone at any position desired. The only caution necessary to give to the users of this saw is not to attempt to drive it as it will surely bind.

The lower turbinated bones should be thoroughly under local anaesthesia before any operation is attempted.

First the nostril should be sprayed with a 20 per cent. solution of cocaine. Ten minutes later a hypodermic injection should be made through a needle 5 in. in length on both sides of the lower turbinated bone of 10 minims of the following mixture: cocaine solution 1 per cent. 5j; adrenalin solution 1:1000 5j. The pain incidental to the injections and the subsequent operation will be entirely absent as a result of the local anaesthesia.

To avoid the fainting sensations which may be experienced as a result of these injections, the patient should be placed in a reclining position before the injections are made and retained there for some time after the operation has been completed.

If it be desired to operate with the patient in a sitting position, about one ounce of whiskey or brandy should be given twenty minutes before the injections are made.

The success of the operation can be established by an experiment with the respirometer. The statements of patients regarding nasal obstructions are never reliable.

patients who have not been operated upon is 10 in. In New York the majority of cases of pulmonary tuberculosis require an operation for the relief of their bronchitis. An ability to raise water to a greater distance than 18 in. in the "respirometer" by a person having pulmonary tuberculosis clearly indicates that an operation on the lower turbinated bone would be beneficial. A description of the "respirometer" and its uses will be found in the *Archives of Otolaryngology*, vol. xxxvi, No. 4, p. 399, 1907; *Ibid.*, vol. xxxvii, No. 5, p. 365, 1908; *Archiv für Laryngologie*, Bd. xxii, Heft 2, 1909. From either of these two last mentioned journals specifications may be obtained which will enable every instrument maker to manufacture the latest "respirometer."

¹ These saws may be obtained from George Tieman & Co.; E. B. Meyrowitz and Kny-Scheerer Co., New York; John Weiss and Son, 287, Oxford Street; Adolph Zwicker, 15 and 16, Thavies Inn, Holborn Circus, London; and Jetter and Scheerer Co., Totlingen, Germany.

INTRA-CRANIAL DEHISCENCES OF THE CAVITIES OF THE EAR AND DEHISCENCES OF THE AQUEDUCT OF FALLOPIUS.

By DR. J. MOURET,

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*Abridged translation*¹ by MACLEOD YEARSLEY, F.R.C.S.,

Senior Surgeon to the Royal Ear Hospital, etc.

(A) INTRA-CRANIAL DEHISCENCES OF THE CAVITIES OF THE EAR.

DR. MOURET was charged, at the International Congress of Medicine at Budapest, in 1909, with a report upon the "Paths of Propagation of Infection from the Middle Ear to the Interior of the Cranium," a work which necessitated attention to the paths furnished by dehiscences of the roof of the middle ear. A study of these openings in the works of Bäreknér and Flesch, Körner, etc., being unsatisfactory, he has made his own researches, the results of which are contained in the present paper.

These dehiscences are studied here both in the adult and the child, and an endeavour is made to explain their origin by studying the development of the roof of the middle ear in the fœtus, from the age of three months, the period at which the petrous is still cartilaginous.

According to Bäreknér and Flesch, dehiscences of the roof have their seat of election in the posterior half of the tegmen tympani et antri. They found them relatively frequent in this region—167 times in 765 crania (21·8 per cent.). They attribute their presence to an arrest of closure of the petro-squamosal fissure, due to a double compression of this part of the tympanic roof produced, on the one side, by the pressure of the developing brain, on the other, by the development of the head of the malleus and the body of the incus.

Such explanation is mere hypothesis. If accepted, it is astonishing that dehiscences of this region are not more frequent (although 21·8 per cent. is fairly high), and that they are not the rule even, since the same conditions are met with in all crania. Moreover, it might be objected that, if in the first part of fœtal life the malleus and incus are in contact with the vault of the tympanum from the start, they soon leave it by the enlargement of the middle-ear cavity. The ossicles are then no longer in contact with the

¹ From the *Bulletins et Mémoires de la Société Française d'Oto-Rhino-Laryngologie*, tome xxvi, 1910, p. 247.

tegmen, and are attached thereto solely by the mucous reflections serving as suspensory ligaments. From the second part of fetal life they are, therefore, no longer susceptible of impeding the development of the tegmen nor the closure of the petro-squamosal fissure. Moreover, as is shown later, if, in the fœtus and the child, this fissure is in relation with the cranial vault, in the adult the petro-squamosal suture is carried further out and is inclined obliquely in the superior wall of the external meatus. This shows that the petrous lamina, which forms the tympanic wall, is developed, in the adult, beyond the tympanum, above the outer attic wall, and consequently beyond the head of the malleus.

In one specimen examined there occurs a linear train of fine dehiscences along the superior wall of the tympanum. Their direction makes it appear as if they were small holes formed at the expense of the petro-squamosal fissure, but more attentive examination shows that the line of the petro-squamous suture is further out, in the neighbourhood of the angle formed by the meeting of the squama with the upper surface of the petrous, that is to say, more than a good centimetre from the line of the dehiscences.

According to Sibenmann, quoted by Bever in his thesis ("Die Fortleitungswege von Mittelohreiterungen in das Gehirn bei der Entstehung von Grosshirnabszessen"), the cause of the dehiscences might be explained by abnormal pneumatisation of the tympanic roof. This explanation is, perhaps, more delusive than that quoted above, but the specimen just mentioned showed an exceedingly thin tegmen, absolutely lacking any cellular cavity on its tympanic side. Further, the petro-squamous fissure does not communicate with the cells, as will be shown later.

Körner, in his monograph, "Die Otitischen Erkrankungen des Hirns," found, according to Bever, a percentage of dehiscences of the tympanic roof much inferior to that of Bäckner and Flesch. In 209 crania they were present only 18 times (8.6 per cent.).

In another article on spontaneous dehiscences of the tympanic roof, "Zur Kenntniss der spontanen Deshiszenzen im Dach der Paukenhöhlen" (*Arch. f. Ohrenheilk.*, xxviii, 169), Körner studied them in dolichocephalics and brachycephalics. He distinguished three varieties: (1) Dehiscences of the roof properly speaking, making communication between the cranial cavity and the tympanum; (2) bony fissures which do not lead directly from the cranial cavity into the tympanum, but into "the other" cavities of the petrous; (3) dehiscences leading into the cells of the superior wall of the external meatus. According to Körner, the roof of the

tympa-num and auditory meatus is thicker in dolichocephalics than in brachycephalics, and dehiscences of the tegmen will be more frequent in these than in others. Körner thinks this in favour of Bäreknér's and Flesch's "wearing of the roof by compression" hypothesis. Dehiscences of the tympanic roof will be, in fact, rare in dolichocephalics. In thirty dolichocephalics Körner found only one case in which a cleft existed, making communication between the cranial cavity, not with the tympanum, but with a cell of the epitympanic system. In ninety-two brachycephalic crania, he found, on the contrary, true roof dehiscences nine times, bilateral in one case. Körner concluded therefrom that median otitis is more dangerous in brachycephalics since tegmental dehiscences are more frequent in them.

Fissures of the superior wall of the tegmen communicating with cavities (cells?), but not with the tympanum itself, have, in their uniformity, appeared to Körner to be more frequent than the dehiscences themselves. In 39 dolichocephalics, 7 showed fissures (2 bilateral), in 92 brachycephalics 16 had them (7 bilateral).

As regards the third variety, Körner stated that he had often seen dehiscences corresponding to the superior wall of the external meatus. These may be sometimes even so numerous as to make the bone appear as if pierced by holes like a sieve, leading to the cells of the superior meatal wall. Körner questioned whether this variety is favoured by the neighbourhood of the angle which "the bottom of the cranial fossa forms with its lateral wall," and said it was not possible to decide. It will be seen later that the cause lies rather in the presence of the petro-squamous suture in the vicinity of the angle in question than in the presence or form of the angle itself.

Dr. Mouret's researches in numerous petrous bones of children and adults have resulted in the discovery of dehiscences of the petrosal cortex in very various situations: (*a*) Tympanic roof; (*b*) antral roof; (*c*) roof of bony Eustachian tube; (*d*) roof of external auditory meatus; (*e*) roof of superior petrosal cells; (*f*) Gasserian fossa; (*g*) region of the summit of the petrous, in the neighbourhood of the passage of the trigeminal and external oculo-motor nerves; (*h*) superior semicircular canal; (*j*) Fallopian canal, in its intra-petrous course.

Some of these dehiscences are punctiform, as in the fossa of the Gasserian ganglion. They lead into the spongy spaces or subadjacent cells, are very frequent and variable in numbers, and

may give the Gasserian fossa a cribriform aspect. The bony structure of this region being more often spongy than pneumatic, it may be said that the areola of the spongy tissue opens freely into the cranial cavity at the level of this fossa.

Others are true foramina, generally fairly small, into which dip prolongations and vessels from the dura mater; such are the numerous narrow holes found along the petro-squamous suture in the adult.

Others represent losses of substance in places where the petrous cortex is very thin. Their edges are irregular and more or less serrated. Single or multiple, they simulate "worm-holes." They may be found everywhere, but more particularly in the roof of the tympanum and mastoid antrum, into either of which cavities they may open directly, as well as into the supra-attic, epitympanic cells, when they occur in the tegmen tympani. These "worm-hole" dehiscences may be considered as due to an arrest of ossification in the petrous cortex. It may, however, be suggested that these dehiscences, found in the skeleton, are due to the stripping off of the dura mater during dissection and are non-existent in the living subject. The dura mater is, as a matter of fact, very adherent to the tympanic and antral roof, outside the petro-squamous suture; but, when the tympanic roof is extremely thin, this adhesion, though it may be weak, can cause undoubtedly bony *tears* as the dura mater is stripped off. The dehiscences will not then be simple perforations. If this be so, the resistance of a bony wall, which always allows of its being so easily *torn*, is so slight a matter that, from the practical point of view, parts thus *torn* and *perforated* by the stripping off of the dura mater may be considered as tissues of least resistance predestined to favour the passage of middle-ear suppurations into the cranium. Hence, if the "worm-hole" dehiscences are not, perhaps, true dehiscences *in vivo*, they may, nevertheless, be considered as such. They represent, in fact, "entries closed simply by something as little resistant as a fine spider web," which may be easily accessible to infective germs from the tympanum, unlike the true spontaneous dehiscences such as the petro-squamous fissure, for example, for this is obliterated by thick and resistant prolongations of the dura mater, which may, at least momentarily, play the part of a barrier.

Dehiscences of the superior semicircular canal, which may be bilateral, have also similar significance. In three cases met with by Dr. Mouret the petrous cortex was excessively thin, the proper wall of the bony canal being blended with it without interposition

of spongy tissue. Dehiscence of the canal might well, in such cases, be only a simple *tearing* of the cortex produced in stripping the dura mater.

The extreme thinness of the petrous cortex in these cases may be attributed to a disturbance of ossification. The cause itself of this disturbance escapes us, and it does not appear necessary to attribute it to excentric pressures, such as compression by weight of brain mass, or by the head of the ossicles. Besides, double compression cannot be invoked for dehiscences of the superior semicircular canal. Further, dehiscences may also be observed in the bony cortex outside the cranial cavity, without mentioning those already spoken of at the tip of the petrous and in the Gasserian fossa. In one specimen, showing these latter, can be seen an enormous dehiscence of the petrous cortex at the level of the jugular fossa, in the vicinity of the anterior condyloid foramen, making a very large communication between the jugular fossa and the intra-osseous spongy tissue. Only some general disturbance of ossification can amount for such a condition.

Other dehiscences show in the form of large breaches or simple clefts or fissures. The best known of these fissures is that corresponding to the line of the internal petro-squamous suture. There are others which have not yet been described, but which Dr. Mouret has found either at the anterior part of the tympanic roof, or over the bony Eustachian tube. One of the latter, in the form of a very large, blunt-edged oval breach, is seen in one of his specimens in the roof of the Eustachian tube. Another specimen shows two clefts in the same locality.

The origin, seat, and oval or fissured form of the dehiscences, are very well explained by the study of the development of the roof of the middle ear. They more often assume the form of a cleft, because they represent a defect of junction between two neighbouring bony laminae, primarily distinct, but becoming joined in the course of their development. As these osseous laminae are primitively separated by a relatively large space, the dehiscence is large, a little elongated, and of oval form, if arrest of ossification occurs early, but it takes the fissured aspect when the arrest occurs late.

These kinds of dehiscences which are formed in the roof of the middle ear, and are in relation to the development of the tympanic vault, are best studied by observation of the development of the vault itself.

It is known that the antral and tympanic tegmen—that is to say,

the roof of the middle ear itself—is formed by a bony lamella, which is derived from the superior wall of the petrous. In the three months' foetus, this petrous lamina, called by the author the *petro-tympanic lamina*, already exists, although of very small extent, and still cartilaginous. It is detached from the anterior edge of the petrous at the level of the protuberance (as yet little marked) of the superior semicircular canal. Externally, it is applied to the fibrous lamina, which is to become the squama, wherein ossification commences. Between the two parts is found a very fine fissure, the petro-squamous fissure, covered by fibrous tissue, forming the outline of the internal petro-squamosal suture. The petro-tympanic lamina covers the antrum, already sketched out, and the posterior part of the tympanum, forming the roof over the malleus and incus. But in front it does not yet extend over the anterior part of the tympanum, which is simply covered by connective tissue. It does not pass the level of a line drawn perpendicularly to the great axis of the petrous, and passing by the internal auditory meatus. This line is very easy to determine, being marked naturally on the superior surface of the pyramid by a *groove*, which extends from the anterior border of the pyramid to nearly 2 mm. from the internal auditory opening. At this level the groove is formed into a canal, which sinks into the bone to open at the bottom of the internal auditory meatus. The facial nerve is in this *groove*, which is, indeed, nothing but part of the Fallopian canal dehiscence at the superior surface of the petrous during foetal life. To this point further reference will be made. The spot where the petro-tympanic lamina ends, corresponds, therefore, at this age, to the point at which the facial nerve passes from the petrous into the tympanum, above the oval window. This corresponds to the posterior half of the inner tympanic wall; *i. e.* the petro-tympanic lamina only covers as yet the posterior half of the tympanum.

At the age of four months the petro-tympanic lamina is elongated, and passes beyond the Fallopian groove in front. It begins to grow a little over the anterior part of the tympanum; bit by bit it extends thus forward and above, and ends by substituting itself for the fibrous lamina which separates the cranial cavity from the tympanum. This development occurs progressively up to eight or nine months, by which time it is almost complete. But the petro-tympanic lamina, in going to meet the spine of the sphenoid, is extended still more forward beyond the tympanum over the Eustachian tube of which it forms also the bony roof.

The petrous and the squama grow at the same time, and the petro-squamous fissure, which separates them, extends, like the petro-tympanic lamina itself, over the whole middle ear. It corresponds to the external part of the roof. This fissure (into which dips fibrous tissue), which forms the suture between the squama and the petro-tympanic lamina, persists during early infancy—placed close to the external border of the vault of the tympanum, and forming in the child the place of least resistance of the tegmen tympani. It is, therefore, at this age, the spot by which suppuration in the tympanum finds an easy passage to the cranial cavity. It is astonishing that intra-cranial complications in the otitis of childhood are not even more frequent from this cause; it might almost be supposed that they would be the rule rather than the exception. Doubtless, however, the fibrous tissue filling the fissure acts as a sufficiently strong *cork* to prevent the progress of infectious germs in the majority of cases. If a fibrous is certainly less resistant than a bony barrier, its presence is, nevertheless, often sufficient.

Later, the petro-squamous fissure undergoes two important modifications: (*a*) It is transformed into a suture by junction of its bony edges: (*b*) it is thrown more outward over the external auditory meatus. This will be referred to later, as, for the present, the petro-tympanic lamina requires further discussion.

In the five or six month fetus, along the internal (petrous) border of this lamina, and starting from the point where it passes the facial nerve, a cleft is seen, which separates it from the petrous. This Dr. Monret calls the *principal petro-tympanic cleft*. On the tympanic side it corresponds to the anterior half of the upper border of the inner wall of the tympanum and Eustachian tube. This principal petro-tympanic cleft is closed bit by bit, during fetal life, by the junction of the petro-tympanic lamina with the petrous. Most often it is closed completely at birth, but it may present small openings (dehiscences) or persist in its whole length and form a long and wide crevice which makes communication between the tympanum and bony Eustachian tube and the cranial cavity (fissured dehiscence of the superior wall of the tube by persistence of the principal tympanic cleft). It is found fairly often in adult crania also.

Beside the principal petro-tympanic cleft and a little outside it, the petro-tympanic lamina very often shows another fissure, sometimes even a third. This starts from the anterior end of the bony lamina and is prolonged forwards, to a greater or less extent, in its

thickness. The author names it the *accessory petro-tympanic cleft*. It is shorter than the principal cleft and corresponds only to the roof of the Eustachian tube, being prolonged but rarely into the tympanic roof. It disappears in the course of development, but it may also persist, and a fissary dehiscence found by the author in the roof of the Eustachian tube, outside one formed from the principal petro-tympanic cleft, in the cranium of a child of eight to ten years, may be attributed thereto.

In an adult cranium Dr. Mouret found a large oval dehiscence, 4 mm. long by 2 mm. broad, opening into the Eustachian tube, and situated at the extremity of the petro-tympanic lamina. This he also considers as formed at the expense of the accessory petro-tympanic cleft.

Turning now to the dehiscences formed at the expense of the internal petro-squamous fissure, those to which most authors have paid attention, it is pointed out that they are of the highest importance, since they not only put the middle ear in direct communication with the cranial cavity, but because it is by the petro-squamous cleft that the vessels pass which connect the tympanic and intra-cranial circulation.

Part of the venous circulation of the tympanum follows this path to join the meningeal circulation. In the fœtus it is a path of venous origin of the highest importance. There exists above and along the petro-squamous cleft a meningeal vein, the *petro-squamosal sinus*, which receives the veins which leave by the roof of the tympanum. This sinus takes a very great part in the first development of the venous system; as it passes across the lateral cranial wall in the region of the base of the zygomatic apophysis, it carries to the external jugular vein a great part of the intra-cranial venous blood, before the internal jugular system is formed. Later on its importance lessens, and it tends to atrophy. Sometimes it persists in the form of a small venule connecting the branches of the middle meningeal vein with the lateral sinus, and it may also connect the intra-cranial venous system with the extra-cranial system of the external jugular by a perforating branch. But, even if it disappears completely, the tympanic veins which leave by the petro-squamous fissure retain their relations with the intra-cranial venous circulation by the intermediary of anastomotic venules, which join either the branches of the middle meningeal vein or the lateral sinus itself. So that, even after the atrophy of the petro-squamosal sinus, the region of the petro-squamous cleft is always highly important, as much from the

anatomical point of view by the tympano-meningeal vascular relations, as from the pathological standpoint by the possible passage of tympanic suppurations into the interior of the cranium, either by phlebitis of the veins, or by direct extension through the cleft itself, if this be persistent throughout or even partially in the form of dehiscences.

The study of this cleft and its dehiscences must be made in the foetus, the child and the adult, as it undergoes important modifications with age. In the foetus and very young child, the petro-squamous cleft corresponds to the outer part of the tympanic and antral vault. If the petro-tympanic lamina be raised along the petro-squamous fissure in the foetus, the head of the malleus is seen beneath it. But, in the transverse direction, this lamina forms only about four-fifths of the tympanic roof. It is completed externally by a tympano-squamous crest, which is detached from the inferior border of the squama. Both lamina and crest are very thin. The petro-squamous cleft is also of very little depth, and is directed vertically from the cranial cavity towards the tympanum.

In the child, the tympano-squamosal crest and petro-squamous lamina which bound the fissure have become somewhat thicker and the fissure has increased in depth. At the same time it is noticeable that the direction of the depth of the fissure is not vertical but oblique from above down and from without inwards, the superior lip of the petro-tympanic lamina being more prolonged than its lower lip. Nevertheless, the fissure still corresponds to the roof of the tympanum properly speaking. A vertico-transverse section of the cranium of a child from eight to ten years old shows this arrangement well, and makes it plain that the fissure forms a true pathway from the tympanum into the cranial cavity. In the child the petro-squamous fissure still exists in its entirety, save quite behind, where junction has already occurred between the squama and the pars mastoidea of the petrous; it passes over the tympanic and antral roof in its whole length. Supra-attic cells, when they exist, are quite independent of the cleft which opens directly into the tympanum and not into any of such cells.

In the adult the fissure, seen from the cranial cavity, completely disappears behind. The venule representing the vestige of the petro-squamosal sinus is itself enclosed in a fine intra-osseous canal, formed by ossification of this spot in its course to the lateral sinus. In front of the posterior portion the fissure may remain sometimes very apparent in the greatest part of its length. In

one specimen¹ the fissure appears from the cranial aspect clearly open at the level of the petro-squamosal angle, a condition also shown by vertical section. Most of it, however, disappears almost completely, leaving, nevertheless, more or less distinct traces in the anterior three-fourths of its length, sufficient to reveal its situation to attentive examination. These traces are formed either by a slight bony edge representing the edge of the upper (cranial) lip of the petro-tympanic lamina, or by small foramina, opening obliquely in the thickness of the bone. The edge formed by the inner border of the petro-tympanic lamina appears sloped at the level of these foramina. Further, there is often a difference of colour between the squama and the petrous.

Care must be taken to seek the remains of the petro-squamous fissure, not in the tympanic roof itself, but more externally, at the level of the angle made by the cranial base with the inner surface of the squama of the temporal. The petro-squamous fissure of the child has, as a matter of fact, undergone very important modifications: (*a*) the depth of the vertical cranio-tympanic plane, in which the fissure is found, has increased; (*b*) this same vertical plane has inclined outwards; (*c*) the lips of the fissure have joined so as to form the petro-squamous suture.

The first of these modifications is due to the thickening of the bony laminae bounding the fissure. The augmentation of the depth of the fissure is consequent upon the thickening of the petro-tympanic lamina and the tympano-squamous crest, which form the tympanic roof. When these parts are thickened uniformly or even when they are hollowed out by pneumatic cells, the fissure remains independent of them.

The second modification, lateral inclination of the vertical cranio-tympanic plane in which the petro-squamous fissure is found, is explained by the enlargement of the cranial cavity in the course of the development of the superior external meatal wall, and by the tendency of the external border of the petro-tympanic lamina to remain connected with the angle which the cranial base forms with its lateral wall.

In the fœtus the external auditory meatus does not, in fact, exist. It is formed gradually by the enlargement of the tympanic ring and of that part of the inferior border of the squama which closes above the interval left free between the two branches, anterior and posterior, of this ring. This portion forms the outer

¹ The paper is illustrated by photographs of specimens demonstrating all the points referred to.—*Trans.*

wall of the attic and supplies the narrow tympano-squamous crest which, outside the petro-squamous fissure, forms the external part of the tympanic roof. Of these two portions formed by the inferior border of the squama, one, the tympano-squamous crest, develops little; the other, on the contrary, the outer attic wall, is thickened and enlarged externally so as to form the superior wall of the external auditory meatus. In developing thus, this part throws the inner surface of the squama more outwards and removes it further from the superior wall of the tympanum. The petro-squamous fissure comes in consequence to be more and more distant from the angle which is formed between the internal surface of the squama and the cranial surface of the bony lamina which constitutes the superior wall of the external meatus. The line of the petro-squamous suture always remains in the neighbourhood of this angle; it keeps to the way in which the petro-tympanic lamina grows. This may, in fact, be looked at, as in all cranial bones, as an external (inferior and tympanic) lamina and an internal (superior and cranial) lamina. Between these two laminae the supra-attic cells develop. The two laminae lengthen unequally, the tympanic one not increasing any more than the cavity of the tympanum grows, and being stopped by contact with the corresponding border of the tympano-squamous crest. The cranial lamina increases more, glides over the latter, covering it entirely and going even beyond it, above the wall of the external meatus. In thus prolonging the petro-squamosal cleft over this wall it contributes to an increase in its depth, whilst giving it simultaneously a very pronounced lateral inclination. Hence in the adult it is necessary to seek the internal petro-squamous suture over the external meatus, near the lateral angle of the cranial base, and not over the tympanum itself.

Nevertheless, the remains of the petro-squamous fissure do not correspond exactly to this angle in all subjects and may be nearer to the tympanic vault, according as the cranial bony lamella of the petro-tympanic lamina is more or less advanced above the tympano-squamous crest and the wall of the attic.

Nor is the lateral inclination of the plane of the petro-squamous suture the same in all subjects. It is, generally speaking, so much the less pronounced as the bone is thicker and as the petro-tympanic lamina is less outwardly inclined; when the roof of the tympanum and of the external auditory meatus are thin, this inclination may almost approach to the horizontal.

When the petro-squamous suture deepens and inclines outwards

it also tends to disappear by bony union and to be transformed into the petro-squamous suture. The line of suture is effaced on the side of the tympanic cavity, but on the cranial side it sometimes persists, presenting, in the dry bone, a large cleft, sinking more or less into the thickness of the bone. It is, however, almost always closed on this side. Nevertheless, in the great majority of cases its intracranial situation may still be recognised, thanks to the points already mentioned, the more important of which being the foramina which allow of the passage of vessels from tympanum to cranial cavity. These vascular communications, notably the venous relations, persist in the adult despite the fact that the foetal petro-squamosal sinus is atrophied. The veins pass to empty into the branches of the middle meningeal. The presence of veins in the line of the petro-squamous suture results, therefore, in true bony canals, which form passages of communication between the cranial and the tympano-antral cavities. The dura mater sends prolongations around the vessels. It is rare to obtain a vertico-transverse section of the temporal bone which involves one of these canals in its whole length, but their upper and lower ends may be found by comparing various sections, and it is then demonstrable that the widest parts are those which border on the cranial cavity. Chance sections show that these canals may present ampullary dilatations, resembling, in the dry bone, cellular cavities, suggesting that the fissure opens into the cells in the superior wall of the external meatus after being closed on the tympanic side; but a more attentive examination shows that this is only apparent. On the cranial aspect, the openings of the canals are ranged along the line of the petro-squamous suture and sometimes encroach upon one another. They may be sufficiently numerous and clearly enough marked to give the region of the cranio-squamous angle a cribriform aspect (Körner). These are, no doubt, the dehiscences of the superior wall of the external meatus of which Körner speaks, and he remarks also that they open into the bony cells. This opinion, however, is considered by the author to be based upon an erroneous interpretation of such forms as have just been described. The supra-attic cells and the cells of the superior wall of the external meatus border on the fissure and its ampullary dilatation, separated from it by their own bony wall. It may, however, be admitted—although Dr. Mouret has not seen it—that communication may take place between them by bony resorption; in such a case the non-sutured portion of the petro-squamous fissure would be dehiscant into the cells of the superior meatal wall.

To sum up, dehiscences of the cranio-squamous angle in the adult may appear, from the cranial aspect, either as a long, deep cleft, or as more or less rounded, and more or less numerous foramina, arranged side by side. The former is a question of the persistence of the petro-squamous fissure on the surface of the cranial floor; the latter is one of orifices of canals containing vessels emerging from the tympanum.

Returning to the dehiscences of the roof of the middle ear, they may be divided into three groups:

(1) "Worm-hole" dehiscences of the tympanic and antral roof, which are losses of substance due to the excessive thinness of the bony lamina.

(2) Dehiscences of the bony roof of the Eustachian tube, arising more especially from persistence of the principal and accessory tympanic clefts existing in the anterior part of the middle-ear roof in fetal life.

(3) Dehiscences proceeding from the petro-squamous fissure. It is expedient to distinguish these as in the child and in the adult: (*a*) In the child the *fissure* persists the whole length of the outer part of the tegmen; (*b*) in the adult the *fissure* becomes a *suture* in its depth, but may remain in the condition of a more or less superficial *fissure* on the cranial aspect, near the cranio-squamous angle; on this level dehiscences are frequently found, arranged along the line of suture, which are merely the orifices of vascular canals putting the tympanum into communication with the cranial cavity.

No attempt has been made to give the percentages of these different dehiscences, as, to make them of any value, hundreds of crania would have to be examined. It is, nevertheless, suggested (*a*) that in the adult dehiscences of the petro-squamous cranial angle are constant, but more or less obvious and variable in number; (*b*) that the petro-squamous fissure is constant in the young child; (*c*) that dehiscences in the roof of the Eustachian tube are fairly frequent and more common than the "worm-hole" dehiscences of the tympanic roof; (*d*) that dehiscences of the Gasserian fossa are almost constant, but more or less small and more or less numerous; (*e*) that dehiscences of the petrous cortex, either at the level of the petrous cells or at the level of the spongy tissue of the tip, or at the level of the superior semi-circular canal, are less frequent, but not rare.

All these dehiscences are dangerous, as they facilitate the passage of otitic suppuration into the interior of the cranium. It

is suggested that the most dangerous of all are spontaneous dehiscences of the Eustachian tube. Otitic infection comes almost always from the naso-pharynx, and the tube is infected before the tympanum; dehiscences of its roof are the first offered to an infection, which may pass them even before, perhaps, it can extend to the tympanum itself.

Be this as it may, certain of the dehiscences above mentioned assist the comprehension of certain intra-cranial complications, the mechanism of which has often been discussed. Paralysis of the external motor oculi, in the course of acute otitis—already well explained by the knowledge of the petrous cells, which may be prolonged up to the tip of the petrous—is even better understood if dehiscences exist in the petrous cortex in the neighbourhood of this nerve. It is the same for primary phlebitis of the petrous and cavernous sinuses. Trigeminal neuralgia is also very easily explained by dehiscences of the Gasserian fossa, which favour the passage of bony inflammation to the Gasserian ganglion. Dehiscences of the superior semi-circular canal facilitate the passage of labyrinth suppurations into the cranial cavity, but may even, by an inverse mechanism, make labyrinth infection easy from an extra-dural abscess.

(B) DEHISCENCES OF THE FALLOPIAN AQUEDUCT.

Facial paresis and paralysis, which are sufficiently frequent in the course of acute and chronic otitis, show that suppurations of the ear penetrate fairly often into the aqueduct of Fallopius. Intra-cranial complications, consecutive to the passage of otitic suppuration along this canal, are also pretty frequent. Infective products follow the aqueduct to the bottom of the internal auditory meatus, whence they pass into the cranial cavity; but they can penetrate into the cranium by the hiatus Fallopii as well, following the great and small superficial petrosal nerves, especially when this hiatus, which is widely open in the fœtus, also remains widely dehiscient in the adult. Suppuration often penetrates into the aqueduct in the train of osteitis of the tympanic wall, as much in the course of acute osteitis as of chronic otitis; but it may also, as in the vault of the tympanum, find in this wall *loci resistentie minoris*, dehiscences which favour its passage. These are the tympanic and intra-cranial dehiscences of the Fallopian aqueduct, which are studied here. The results confirm what is known already, and what is mentioned in *l'Embryologie de Kölliker* (French

translation, 1882, p. 767), but which the books on anatomy and otology neglect too much. There is, in addition, a tympanic dehiscence of the aqueduct which has not yet been described.

According to the authors quoted by Kölliker, dehiscences of the aqueduct are especially situated at the level of its passage above the oval window. In the fœtus the Fallopian canal is very short, extending only from the bottom of the auditory meatus to the neighbourhood of the hiatus, and having a length of scarcely 1 mm. (Joseph, Vrolik, Gegenbauer). From the hiatus to the stylo-mastoid foramen the canal does not exist, the facial nerve passing simply in a groove which is marked on the cartilage and merely covered in the tympanum by the tympanic mucosa. Outside the tympanum, in the *pars mastoidea*, the nerve is not even placed in a groove but passes simply over the cartilage. In these two regions (tympanum and mastoid) ossification surrounds the nerve, and forms a bony canal all round it. This canal is, however, almost always incomplete (Hente, Kölliker), and presents a lacuna above the oval window, a lacuna closed merely by the soft parts, periosteum and mucous membrane.

Kölliker makes no mention of the persistence of the fœtal intra-cranial dehiscence of the region of the hiatus in the adult. Nor has a dehiscence of the aqueduct at the level of the superior internal angle of the tympanum been mentioned at the point where the aqueduct makes its first bend to pass the petrous on the inner surface of the tympanum. This dehiscence the author has found three times, and it would peculiarly facilitate the passage of suppuration from the tympanum into the aqueduct and the cranial cavity.

Dehiscences of the Fallopian aqueduct may, therefore, open into the cranial and tympanic cavities. In this they have two seats of predilection: (a) above the oval window, (b) at the level of the bend made by the aqueduct to pass over the inner tympanic wall.

Intra-cranial Dehiscences of the Aqueduct in the Region of the Hiatus Fallopii.—The name "hiatus Fallopii" is given to a small intra-cranial orifice by which the great superficial petrosal nerve passes, coming from the geniculate ganglion of the facial. The hiatus represents the orifice of a small bony canal, the canal of the great superficial petrosal nerve, which is of greater or less length according as the hiatus is more or less close to the place where the facial nerve passes, *i. e.* to the aqueductus Fallopii. Generally this canal is 1 cm. long, but sometimes it is reduced to zero, the hiatus then being even over the Fallopian canal, and the

petrosal nerve enters the cranium immediately on leaving the facial nerve. In this case the small canal is represented simply by a groove in which lies the petrosal nerve, and it may be said that the canal of this nerve is largely dehiscant into the cranium. But in this arrangement the hiatus, which then lies immediately over the aqueduct, may be very large, and instead of forming a small chink destined for the passage of the petrosal nerve, makes a large breach which lays bare a good part of the aqueduct and of the facial nerve. It is then a question of a true dehiscence of the canal of the petrosal nerve and of the external portion of the aqueduct.

In an illustrative specimen the lumen of the canal is seen going on one side towards the internal auditory meatus, and on the other towards the tympanum, forming its first bend where the geniculate ganglion of the facial is found. The arrest of development of the whole canal of the petrosal nerve and of the corresponding part of the aqueduct is seen clearly. The intracranial extremity of the petrosal nerve-canal is simply a deep groove, bounded on either side by a well-marked bony edge forming the outline of its roof. This arrangement, dehiscence of the canal of the petrosal nerve and dehiscence of the intra-petrous portion of the Fallopiian canal, reproduces the foetal disposition of the same parts.

In the later periods of foetal life, neither the external part of the intra-petrous course of the facial nor the great superficial petrosal nerve are covered by bone. On either side of the principal petro-tympanic cleft for a distance of 1-2 mm. the bony plane, as much of the petro-tympanic lamina as of the petrous itself, is slightly inclined in the form of a groove, ending behind at the open part of the Fallopiian aqueduct. On either side of this groove is seen a bony crest, which is continuous with a similar crest bounding, behind, the open part of the Fallopiian canal. The closure of this region is brought about by the raising and lengthening of these three bony crests. They tend to approach one another and to transform the large groove into a canal which contracts bit by bit, and in which are contained the great and small superficial petrosal nerves. Later on, a septum isolates these two nerves from one another. But the covering in of all this region is more particularly effected by the lengthening of the posterior bony crest, which passes above the facial, and is prolonged over the petrosal nerves as it joins with the corresponding border of the lateral crests. It even appears that it is the development of this part which alone ensures the closure of all this region, and

that the lateral crests serve solely to limit it without being able to close it completely. As a matter of fact, crania are found in which, the Fallopian canal being completely covered by the bony lamina, the exit of the superficial petrosal nerves from the petrous occurs very close to the aqueduct. Others, on the contrary, show it at a distance of over 1 cm. from this canal. In the former it may be said that the canal of the petrosal nerves is alone dehiscient. This disposition is met with fairly frequently. But the author has never met with any crania in which the petrosal nerves have been enclosed in a bony canal when the outer part of the intra-petrous portion of the aqueduct was dehiscient; when the latter is the case the canal of the petrosal nerve is dehiscient also. Nevertheless, this can be so without the aqueduct being affected. The canal of the great superficial petrosal nerve appears therefore to exist only if the bony lamina, which arises from the posterior crest of the groove of Fallopius, has first covered the facial, and is prolonged sufficiently between the two lateral crests which bound the *facial groove* of the canal of the petrosal nerves.

Dehiscences of the Aqueductus Fallopii above the Oral Window.—

In its course on the inner tympanic wall, above the oval window, the Fallopian aqueduct forms a prominence of cylindrical form. Looking at this projection from the side of the oval window, there is often seen a kind of bony cicatrix, in the form of a groove, giving the impression of a scratch. This cicatrix indicates the seat of the dehiscence of the lower border of the aqueduct above the fenestræ oralis. In fact, it is not rare to find, in the adult, the aqueduct there open by an oval orifice, an arrangement still more frequent in the young child. A study of development further shows that it is here a question of arrest of ossification of the tympanic wall of the aqueduct. This wall may also show other foramina in its surface, resembling small holes made with a pin.

Tympanic Dehiscences of the First Bend of the Fallopian Aqueduct.

—As its name implies, this dehiscence is seated at the level of the first bend which the facial forms, and corresponds to the point of junction of the superior tympanic wall (petro-tympanic lamina) with its inner (petrous) wall. It occurs in the form of a cleft, the depth of which is measured by the thickness of the superior tympanic wall, and the author has found it only on petrous bones of which this wall was very thin. It is due to a faulty junction of the inner (petrous) border of the petro-tympanic lamina with the extremity of the bony lamina which closes the groove representing the tympanic aqueduct in the fœtus.

Study of the development of the Fallopian canal permits the origin of dehiscences in its course on the inner tympanic wall to be properly understood. In the fourth month fœtus the anterior extremity of the petro-tympanic lamina scarcely reaches the level of the facial nerve, which is not yet contained in a bony canal throughout its course through the temporal. A canal exists only in the neighbourhood of the internal auditory meatus; beyond this first interosseous part the nerve passes simply in a *groove* on the surface of the petrous, then it makes its first bend and enters the tympanum, passing along its inner wall in a similar *groove* and simply covered by the tympanic mucous membrane. As it lengthens, the petro-tympanic lamina passes below the facial bend, joining to the two lips of the groove which contains it, and here transforms this into a bony ring in which the nerve passes. The *groove* of the facial is thus found to be divided into an intra-cranial part (large hiatus) and a tympanic part. This closes more rapidly than the first. The intra-cranial portion very often remains open in the eight to nine month fœtus, whilst the canal is already well outlined in its tympanic part in the six month fœtus. Along its course on the inner tympanic wall, ossification starts from the superior lip of the Fallopian groove and covers the facial nerve by joining its lower lip, which is nearest to the oval window. Closure of the aqueduct at the level of the part of the inferior lip of the groove which is immediately above the oval window occurs slowly. Traces of this tardy closure are often very marked here by a depressed line in the form of a scratch, as mentioned above. Ossification is often, nevertheless, not accomplished at this point during the first years, and may even never take place; there is then an oval dehiscence.

In order that the closure of the tympanic portion of the Fallopian aqueduct may be complete, it is necessary not only that the bony lamella should close this part of the canal from the superior border to the inferior border of the groove in which the facial nerve first reposes, but it is also necessary that this lamella, which transforms the groove into an aqueduct, should join by its anterior extremity the corresponding border of the petro-tympanic lamina, which, as has been said, originally forms a bony ring round the first facial bend as it joins the corresponding border of the petrous. If this does not take place, a tympanic dehiscence persists at the superior internal angle of the tympanum and at the first bend of the Fallopian aqueduct, which puts the tympanum into direct communication with the hiatus Fallopii, *i. e.* with the cranial

cavity. This dehiscence may be produced when the tympanic vault is very thin, as if the corresponding border of the petro-tympanic lamina is not sufficiently thickened to be able to meet and join with the extremity of the bony lamina which closes the tympanic portion of the Fallopian aqueduct.

Conclusion. — The different dehiscences of the Fallopian aqueduct have a very great but unequal importance in the propagation of suppuration into the cranial interior. The tympanic dehiscences alone favour the passage of pus from the tympanum into the aqueduct. The intra-cranial dehiscences favour its effusion into the cranium, and conduce more especially to the formation of an extra-dural collection, while, if the pus follows the aqueduct up to the bottom of the internal auditory meatus, it easily sets up meningitis on account of the *culs-de-sac* sent by the arachnoid round the facial and auditory nerves at this part. But, whilst an extra-dural purulent collection is formed on the upper surface of the petrous, proceeding from quite another part of the aqueduct, the hiatus Fallopii and especially the large dehiscence of the intra-petrous part of the facial canal may also serve as a path of derivation, and direct it towards the bottom of the internal auditory meatus in contact with the same arachnoid *culs-de-sac*.

SOCIETIES' PROCEEDINGS.

PROCEEDINGS OF THE AMERICAN LARYNGOLOGICAL, RHINOLOGICAL, AND OTOLOGICAL SOCIETY.

Seventeenth Annual Meeting, Atlantic City, June 1, 2, and 3, 1911.

Report by DR. L. M. INGRAM.

Thursday, June 1, 1911.

DISCUSSION ON DISEASES OF THE SALIVARY GLANDS.

ANATOMY AND PHYSIOLOGY OF THE SALIVARY GLANDS.

By DR. R. JOHNSON HELD (New York City).

A *resumé* was given of the chief anatomical and physiological features of the salivary glands. The subject was discussed under the following heads: (1) The anatomical structure of the parotid, submaxillary, and sub-lingual glands. (2) The histological structure of these glands.

(3) The secreting cells. (4) The mechanism producing activity of the secreting cells. (5) The changes in the glands during secretion. (6) The quantity, character, and properties of the fluids secreted. (7) The conditions affecting the secretions.

The glands were classed in the following groups: The labial glands in the submucosa of the lips; the buccal glands, found between the buccinator muscle and the oral mucous membrane; the palatal glands found in the mucous membrane of both the hard and soft palates, and especially on the uvula; the molar glands in the mucous membrane behind the last molar teeth; and the lingual glands which are situated beneath the mucous membrane of the tongue, particularly in the region of the circumvallate papillæ and along the lateral margins.

It should be noted in operating upon the region of the parotid, the largest of the salivary glands, that the space which this gland occupied between the ramus of the lower jaw and the mastoid process can be increased in size by extending the head, with the mouth open; the angle of the jaw is carried backward and the condyle forward, increasing the width of the space above and diminishing it below. In infants, owing to the obliquity of the ramus of the jaw, the space is broader below when the angle of the jaw projects forward. The parotid gland is important, not only on account of its function, but on account of the relation it bears to the surrounding parts, and the important structures found within the substance of the gland. These structures, from without inward, are: (1) The facial nerve, with its cervico-facial and temporo-facial branches; (2) the temporo-maxillary vein; (3) the superficial temporal vein; (4) the internal maxillary vein; (5) the posterior auricular vein; (6) a branch from the temporo-maxillary vein to the internal jugular vein; (7) the external carotid artery and its terminal branches, the temporal and internal maxillary arteries; (8) the great auricular and auriculo-temporal nerves.

On account of the intimate relationship existing between the parotid gland and the external auditory meatus, it should be borne in mind that a parotid abscess may open into the external auditory canal.

As experiments have shown, the flow of saliva is a nervous reflex phenomenon acting as a result of efferent impulses, affecting the secreting cells directly, while the vascular changes which occur simultaneously may assist, but are not the direct cause of the flow. The flow of saliva is influenced by various physical and mental states. Certain drugs also exert an influence over the secretion of saliva.

SYMPTOMS AND DIAGNOSIS OF DISEASES OF THE SALIVARY DUCTS.

By DR. ROBERT C. MYLES (New York City).

The symptomatology of infectious parotitis was briefly reviewed. A case was cited of chronic inflammation of all three salivary glands and their ducts, with occlusion and swelling of the ducts occurring almost every week for many years, relieved by systematic dilatation of the ducts and the use of astringent and germicidal injections.

Another type of symptoms is presented in cases of chronic suppuration, with necrotic changes in the gland, especially after typhoid fever. Such cases frequently end in death.

The most frequent symptom of disease of the salivary glands and ducts is enlargement of either one or both. Gouty infiltrations are most frequently not detected. The author's set of salivary duct-probes are

valuable for detecting calcareous concretions within the ducts or the glands. A heavy needle, placed in a needle-holder at right angles to the shaft, and passed through the suspected area, will frequently detect a stone.

The author has seen two cases of stones in the submaxillary glands where a diagnosis had been made of cancer.

TREATMENT OF DISEASES OF THE SALIVARY APPARATUS.

BY DR. JOSEPH C. BECK (Chicago).

The treatment of each of the following conditions affecting the salivary glands was discussed: Ptyalism or salivation, aptyalism, dry month or xerostomia, parotitis epidemica, sialodochitis or acute infection of the ducts and glands, acute suppurative of the salivary glands and ducts—abscess; phlegmonous inflammation of the salivary glands, Ludwig's angina, simple chronic hypertrophy, cysts and ranula, air-tumours in the salivary ducts, chronic granulomata of the salivary apparatus, neoplasms, calculi, salivary gland fistula, salivary duct fistula.

In discussing the treatment of these conditions, it is not only necessary to understand the anatomy, physiology and diagnosis, but the aetiology and pathology must be taken into account in order to treat the subject comprehensively. The management of diseases of the salivary apparatus, like many of the border-line subjects, is at present still in the hands of various special branches, as the dentist, oral surgeon or stomatologist, general surgeon, laryngologist, and others. As a consequence, there are many varieties of treatment, and many contradictory statements.

The treatment may be considered under the heads of (1) systematic and preventive treatment of lithiasis; (2) local treatment directed toward (a) punctum and ducts (b) gland proper; (3) the management of the salivary apparatus in acute infectious diseases, especially mumps; (4) the surgical treatment of duct obstruction and ranula—(a) stone, (b) cicatricial obliteration following ulceration, (c) neoplasms; (5) the treatment of acute abscess, chronic granulomata, and neoplasms of the salivary glands; (6) treatment of salivary fistulae.

Dr. JAMES A. BABBIT (Philadelphia) called attention to the increasing realisation within the last few years of the importance of the salivary glands. The conditions affecting these structures might be grouped under four heads: (1) Those conditions which involved the salivary glands *per se*, viz. neoplasms; (2) conditions in the oro- and nasopharynx which were secondary to disorders of the glands; (3) defective stages of metabolism which might be of glandular aetiology; (4) latent infections, the causes and effect of which, through connection with most important anatomical structures, might be incident to glandular activity. He had been surprised in tracing hospital records of operations upon the salivary glands to find their comparatively limited number. Among the list were fibroma, carcinoma, lymphomas, keratoma and tumours of mixed type. In 45 per cent. of cases listed in two of the large hospitals, operative procedure resulted in facial paralysis, partial or complete. Especial emphasis was given to the part which he believed to be played by the various metabolic conditions in the pathology of the salivary glands, particularly the parotid from its size and anatomical position. He referred in this connection to the propaganda of Horace Fletcher, an enthusiast upon the subject of "salivary digestion" and "salivary activity" as the keynote of health.

Dr. THOMAS HUBBARD (Toledo, Ohio) had seen cases of recurrent parotitis. In one the condition proved to be due to calculus. During ten years the recurrences had taken place as often as once or twice a month. The submaxillary gland was involved. The calculus, which could be felt by means of a probe, was removed under local anaesthesia, with complete relief. In another case recurrence took place once in about six months. He had also seen a case of parotitis following appendectomy, with rupture into the external auditory canal near the tympanic ring. This occurred about ten days after the operation. He had operated upon one case of salivary fistula of the cheek in a child, employing a method slightly different from that described by Dr. Beck. A curved needle with a small silver wire was used, and the operation was performed under local anaesthesia. The duct was completely encircled, and a double perforated shot was passed over the silver wire and fixed by compression. Daily twisting of the wire brought it through in a very few days. The cure was permanent. The duct was severed between the fistula and the gland, and it drained thereafter permanently into the mouth. Referring to the aetiology of epidemic parotitis, attention was called to the work of Dr. Elizabeth Herb, of Chicago, who had conducted a series of experiments. She had produced experimental parotitis by injecting into the ducts diplococci from a case of mumps. From these experiments and others it would seem quite probable that the cause of parotitis has been definitely determined. An interesting condition is emphysema of the salivary glands, caused by high tension, as obtains with players of wind instruments, glass blowers, and others. Dr. Dorendorf (*Zeitschrift für Ohrenheilkunde*, etc.) recorded cases in musicians in Freiburg. Permanent dilatation may occur. The selective action of the diplococcus, or whatever the definite causative agent may be, upon the acoustic nerve should be more carefully investigated, particularly with reference to nerve-deafness. He had had four cases of labyrinthitis with permanent nerve-deafness due to epidemic parotitis. The onset of the symptoms is sudden. Two of the patients were children and two were adults. Symptoms of labyrinthitis came on suddenly in the night—nausea, vertigo, vomiting, and absolute deafness. In children this was often overlooked; they were not watched carefully enough and subjective symptoms were soon forgotten. One of these patients went several weeks before the family discovered that he was deaf in one ear. It was finally noticed by the mother that he did not answer promptly when called, and this was due to the fact that he could not locate the direction of sounds. Hearing was perfect in the other ear, whereas tests proved that it was absolutely lost on the affected side. Vertigo, tinnitus, and headache were the prominent symptoms of labyrinthine invasion in this case. Routine and thorough inquiry by otologists as to the causative relation of mumps to deafness, particularly in all cases of nerve-deafness of unknown origin, was advised; and further, the duty of resorting to prophylactic measures in order to prevent this should be impressed on pediatricians. Investigation showed that from 2 to 5 per cent. of the cases of nerve-deafness in deaf-mute institutions had been caused by mumps; and more than 2 per cent. of cases of infective labyrinthitis were due to mumps.

Dr. JOHN R. WINSLOW (Baltimore, Md.) mentioned a paper on diseases of the salivary glands, read by him about two years ago before the Laryngological Section of the Medical and Surgical Faculty of Maryland—two cases of salivary calculus, previously published by him. One was that of a young man who had had recurrent inflammation of

the submaxillary gland on the left side, for which no cause could be found. After several recurrences a small lump was discovered at the mouth of the gland, and this was clamped with a hemostat and removed by slitting the duct. It proved to be a calculus of the size of a millet-seed. In other words, the cause of the inflammation was a moveable calculus, which from time to time became impacted and caused obstruction to the outflow of glandular secretion. In the other case a crescentic calculus was removed from an abscess in front of the larynx. It had formed in the parotid gland and had migrated downward in the tissue of the neck.

Dr. GEORGE L. RICHARDS (Fall River, Mass.), referring to cancer of the salivary glands, said he had made an error of diagnosis in this regard. When the supposed cancer was removed he found at the bottom of it a calculus which was responsible for the entire condition. The general surgeon and the family physician had concurred in the diagnosis of cancer. Calculi were sometimes easy to find, and sometimes they were not. Two years ago he had removed a submaxillary gland in a case in which a piece of straw was the cause of the trouble. The patient had always insisted that he had a piece of straw in the gland, it having lodged there while he was picking his teeth with the straw. He had had three cases in all. He had seen Killian do an operation for calculus of the submaxillary gland in a case in which a radiogram showed the exact position of the calculus. It could not be found where it was shown to be. When practically the entire gland had been removed it was found much higher than had been supposed. When there was swelling, coming on reasonably early, and in a person relatively young, the presumption was against cancer. In such cases calculus could usually be found.

Dr. M. D. LEDERMAN (New York City) called attention to the fact that calculi might exist in the salivary ducts without giving rise to acute symptoms. He cited the case of a young man with a rather severe infection of the neck, resembling a so-called Ludwig's angina. He was unable to swallow, the saliva poured over his lips, his tongue protruded, and he had an elevation of temperature. Both submaxillary and sublingual glands on the left side were swollen and tender. The possibility of an infection of a streptococcic nature was considered. The patient said a year or two before he had expectorated some hard substance, but had no local inflammatory symptoms at that time. On passing the finger over the floor of the mouth a hard substance could be felt. Incision was made and a calculus, three quarters of an inch in length, was found. This had obstructed the sublingual and submaxillary ducts. By milking the glands pus was drained through the incision. The patient made a complete recovery.

Dr. L. B. LOCKARD (Denver Co.) reported a case of a man aged twenty-four, who had had pulmonary tuberculosis for two years, when there appeared a hard swelling of the left parotid gland which was diagnosed as mumps. After one week some softening occurred, and upon incision an ounce and a half of pus was evacuated. This contained diplococci. Suppuration continued, and five weeks later the cavity was curetted, and microscopical examination showed large numbers of tubercle bacilli, but no diplococci. About this time the right parotid became swollen and tender, and the pus evacuated by incision contained both the diplococci and tubercle bacilli. The diplococcus was identical with the organism of parotitis. At the end of five months there was still a purulent discharge on the right side, while on the left there was nothing but saliva.

Dr. GEORGE F. KEIPER (Lafayette) recommended the administration of potassium iodide in cases of dry mouth from insufficient salivary secretion. He called attention to the possible relation of bulbar paralysis to apparent increase of salivary secretion.

Dr. JONAS F. CULP (Harrisburg) emphasised the fact that calculi might exist in the ducts of the salivary glands for some time without giving rise to symptoms. He had had under his care a policeman who had had trouble with one of his parotid glands for about three years. It would swell, become very painful for twenty-four to thirty-six hours, then subside. He was sure that the trouble was due to a calculus; he probed for it, but did not find it. Finally the patient came to him with the report that a hard stone had passed out of his mouth, and that he was now all right. He had had no trouble since.

Dr. NORTON L. WILSON (Elizabeth, N. J.) reported a case similar to that mentioned by Dr. Hubby, in which abscess of the parotid gland ruptured into the external auditory canal, except that in his case it followed typhoid fever.

Dr. MYLES, in closing the discussion, mentioned an interesting case in which the stone was in the submaxillary gland, and the fistulous tract opened at the glosso-epiglottic fold. Immediate action was necessary in order to prevent suffocation. He thought it was a thyro-glossal cyst, but it proved to be a salivary cystic fistula. The cavity was opened and a stone removed. One should be persistent in the effort to make a diagnosis, as these patients suffered much more than might be supposed. When the stone was in the duct spontaneous temporary relief frequently occurred. Spasm or swelling of the duct closed its lumen around the calculus, shutting in a certain amount of secretion behind the stone, and this caused great distress. When the duct was sufficiently dilated by the retained secretion, the obstruction was relieved and the discomfort subsided.

THE FRENCH SOCIETY OF LARYNGOLOGY, OTOLOGY AND RHINOLOGY.

May 8, 1911.

President : E. ESCAT (Toulouse).

Reported by A. R. SALAMO (Paris).¹

TREATMENT OF SYNECHIE OF THE NOSE.

By DR. BRINDEL (Bordeaux).

The author recalled an old method of treating nasal synechie which, according to him, is far more efficacious than any other, namely treatment by chromic acid. After enumerating the various methods which had been proposed during the last twenty years, he said that for two years he had constantly employed, with good effect, chromic acid interposed between the raw surfaces of the nose.

¹ Translated from *Les Archives Internationales*, tome xxxi, supplement to No. 3.

Dr. LAVRAND (Lille) did not think that chromic acid could be of much service in posterior synechiae in a congested nose.

NEW USE OF SERUM THERAPY IN SPASMODIC RHINITIS.

By DR. MIGNON (Nice).

The principle of the treatment consists in immunising the patients with sera, the nature of which varies according to the pathogenesis of the disorder. Acting on this principle the author had successfully treated a patient whose spasmodic attacks were induced by the smell of a horse,¹ with horse-serum, in the form of Roux' serum given daily in small doses. This good effect could not have been obtained from any of the common forms of treatment. The experience ought to lead to further research along these lines.

Dr. MOLINIÉ (Marseilles) thought that the case had occurred too recently to permit of any definite conclusion. He recalled the old treatment of ozæna by Roux' serum, which had to be abandoned because of its dangers.

Dr. BOXAIN (Brest) believed the action of the serum to have been local and only palliative, besides being short-lived.

Dr. LUC (Paris) asked whether any of the members had seen a case of nasal asthma due, as in this case, to the smell of a horse. He himself had known such a case.

Dr. PERCEPIED (Mont Dore) said that asthma itself had been treated by horse-serum, which acted probably by augmenting the defensive powers of the organism.

Dr. CHAVASSE (Val-du-Grâce) remarked on the rarity of the affection.

Dr. RAUGÉ (Challes) had seen nasal asthma induced by a mule; but it could be started by the odour of many different animals.

Dr. CASTEX (Paris) asked what had been the results of pollantin?

Dr. GAREL (Lyons) deprecated the use of serums in a disease which was often set up by some simple and easily removable factor.

SOME RARE CASES OF FIBRO-MUCOUS POLYPUS OF THE NASO-PHARYNX.

By DR. MOURE (Bordeaux).

The speaker showed two fibro-mucous tumours extirpated *per vias naturales* by means of the finger passed up behind the soft palate. The first of the growths was lobulated like a number of pears joined together. Its size was that of two or three mandarin oranges. The other was unilobate, and resembled a banana. They were attached to the periphery of the choana by means of a long fibrous pedicle, which he had had no difficulty in cutting.

Dr. LAVRAND (Lille) said that when these growths recurred it was due, not to incomplete removal, but to a patch of persistent osteitis.

¹ In the Section of Pathology at the recent meeting of the British Medical Association at Birmingham, Dr. James Ritchie (Edinburgh) stated that he was anaphylactic to animals, and that the smell of such an animal as the horse gave him bad attacks of asthma. He had been exposed to the action of tetanus toxin, and as a result had injections of anti-tetanic serum. In about two hours he had an attack of asthma with severe urticaria. He would not again use antitoxic serum without considerable hesitation.—D. M.

Dr. JACQUES (Nancy) remarked that there was little certainty regarding the nature and type of these growths.

FIBROUS POLYPUS OF THE NOSE.

By Drs. JACQUES (Nancy) and BERTEMÈS (Charleville).

As a contribution to the obscure question of the classification and aetiology of connective-tissue hyperplasia of the nasal fossae, the authors reported two cases of fibromatous growths, of slow formation, rooted in the anterior ethmoidal region, and leading to a deformity of the bones of the nose. The one, from a man, aged thirty, contained cavernous blood-spaces; the other, from a child of eight years, was cystic, and had simulated a meningocele. What was the nature of these polypi? According to German authorities they were cedematous fibromata. We should, however, distinguish between fibromata and fibro-mucous polypi.

Dr. DÉLIC (Ypres) said that fibrous polypi were attached to the neighbourhood of the posterior part of the superior turbinal.

OSTEOMA OF THE MAXILLARY ANTRUM.

By Dr. PHILIP (Bordeaux).

Only ten cases of osteo-fibrous tumours of the antrum had been published. The author's instance, hitherto unpublished, was that of a young man, aged nineteen, who consulted him on account of nasal obstruction accompanied with asymmetry of the face. In spite of repeated cauterisations and turbinectomy performed three years previously, the functional improvement had been of short duration and the unilateral nasal stenosis had quickly returned. During this period the face had very slowly but progressively become asymmetrical. The left cheek-bone appeared more prominent and the alveolar process larger. When he first consulted the speaker the malar bone and the anterior portion of the superior maxilla were distinctly prominent, and palpation showed all the osseous projections to be obliterated. The skin and the orbital edge retained their normal appearance. There was no edema, pain or exophthalmos. On looking into the mouth the left half of the bony palate was seen to be somewhat lower than the right. This depression extended as far as the alveolar process, which appeared to be larger than usual. The teeth were healthy, and the anterior part of the alveolar process sloped forward and upward to merge insensibly into the projecting malar bone. The right side of the nose was normal. On the left side the naso-antral wall bulged into the nasal cavity, and being in contact with the septum, had caused complete stenosis of the passage. Transillumination showed the left antrum to be dull and the right clear.

The slowness of growth and the absence of pain and glandular enlargement led to a diagnosis of an innocent tumour of the antrum.

Operation was undertaken in June, 1910. The antrum was opened through the canine fossa, but instead of breaking into the cavity with the first blow of the mallet, removal of the bony wall disclosed a mass of spongy bone, which completely filled up the antral cavity. There was no sign of any plane of cleavage or line of demarcation between the compact bone of the surface and the spongy tissue in the interior of the tumour. By means of a sharp curette an artificial cavity was excavated in the

bony mass, penetrating to the vault of the palate below and the orbital floor above. Then the antro-nasal wall was broken down. Complete recovery ensued.

Histological examination resulted as follows: In the midst of a stroma, fibrous for the most part, but here and there showing a mucous structure, there appeared an extensive scaffolding of bony tissue—osteoblasts with stratified osseous lamellae and medullary spaces with their usual contents. The bony tissue exhibited different stages in development, and the presence of osteoblasts and a kind of polychromatophilia represented a stage not far removed from the pre-osseous. Occasional myeloblasts in connective tissue gave evidence of a feeble attempt at absorption.

Dr. CASTEX had come across a case of osteoma of a type such as had been described in the old treatises—true diffuse hypertrophy.

FIVE CASES OF LARYNGEAL STENOSIS TREATED BY LARYNGOSTOMY.

By Drs. SIEUR AND ROUVILLOIS (Val-de-Grâce).

Of the five cases four had followed typhoid laryngitis and one traumatism. In two the laryngeal disease had been trifling, while in the other three portions of the cartilage had been lost and the inflammation had invaded the tissues around the larynx. In the two former patients laryngostomy was followed by rapid cure, both from the point of view of function and as regards the firm closure of the laryngo-tracheal wound. In one of the cases the wound began to cicatrise from the moment that the dilating tube was removed.

In the other, the more serious cases, dilatation proceeded very slowly, and while it was possible to remove the tracheal tube it was difficult to decide when to remove the dilating tube. The larynges, profoundly damaged by the inflammation, and sometimes also irritated by untimely efforts to dilate them, were deformed, constricted by perilaryngeal adhesions, and, above all, rigidly fixed at the level of the arytenoid articulations, so much that, in spite of the fact that the calibre of the larynx was sufficient, the difficulty of inspiration continued in consequence of the fixation of the cords. As a result the patients, fearing the occurrence of asphyxial attacks, preferred to retain the tube, which they had learned to introduce themselves.

In spite of this partial check to laryngostomy in such unusual cases as these, the authors were of opinion that the patients, by the removal of the tracheotomy tube and the utilisation for breathing of the natural passages, were less exposed to the colds and infections which otherwise threatened them. The presence of the (dilating?) tube, moreover, did not inconvenience phonation.

Dr. MOURE (Bordeaux) said that in traumatic stenoses laryngostomy gave very good results. Stenoses due to post-typhoid inflammations were amongst the most difficult cases.

Dr. SARGNON (Lyons) insisted upon slow dilatation. He employed local anaesthesia with anaesthesia of the superior laryngeal nerve. This method, which was absolutely ideal, had removed all danger from laryngostomy.

SOME RARE CASES OF LARYNGEAL CANCER: CONSIDERATIONS ON THYROTOMY.

By Dr. MOURE (Bordeaux).

Attention was particularly directed to a number of cases of cancer of

the larynx in which the evolution of the disease had been extremely slow. This type had been specially observed in relatively young women, between thirty-five and forty-five years of age. In some of the patients the growth, several times removed through the natural passages at intervals of several years, had recurred slowly but persistently. No microscopic evidence of the malignant nature of the disease was obtained until after successive removals, and then only at a period long after the first appearance of the growth. In these cases removal of the disease by thyrotomy was not invariably successful, as the growth had recurred, perhaps even more rapidly than after the first tentative removal. On the other hand, when the patients had been willing to submit to total or partial extirpation of the larynx, definite success had been the rule. One of the patients had been operated on as long as four years previously, and was still in good health. Another, also, in whom a partial laryngectomy had been performed, showed, at present, no sign of recurrence. Two other cases, in which tracheotomy only had been done, had survived much longer than is usual in epithelioma, carcinoma, or other malignant degenerations of the larynx. This type of cancer, therefore, is worthy of a special place in description.

Adverting to the different methods of performing thyrotomy, the speaker considered that, at the present day, the operation should be performed under cocaine and sometimes even without preliminary tracheotomy. When, for one reason or another, it was necessary to open the trachea before performing thyrotomy, Dr. Moure advised the employment either of the vertically flattened cannula he had exhibited at the International Congress at Vienna some years ago, or of a cannula flattened transversely, which should be inserted in the intercrico-tracheal space. This device enabled us to dispense with section of the tracheal cartilage, and so rendered more easy the coaptation of the laryngo-tracheal incision, which ought to be carried out as soon as the operation was finished.

Dr. MOLINIÉ (Marseilles) said that many observers had remarked the occasional slowness of evolution of laryngeal cancer. But the occurrence of cancer of the larynx of this type in women, alluded to by Dr. Moure, was a new and interesting fact. The speaker wondered whether radium would prove useful in these cases.

Dr. MOURE, in reply, said that the disease occurred in young women. He had tried arsenical paste in similar growths but without much success. In old people slowly growing cancer is common.

CICATRICAL STENOSIS OF THE JUXTA-BRONCHIAL TRACHEA: SECTION; DILATATION.

BY DR. PAUL LAURENS (Paris).

The case was one of cicatricial stenosis of the trachea of syphilitic origin. Small incisions were made in it by means of the blade of a urethrotome.

Dr. MOLINIÉ (Marseilles) had published a case of tracheal stenosis situated low down, of which the cause was unknown. In a fair number of these cases it was impossible to be sure of the cause. From this point of view the present case was unusual.

TWO CASES OF THYROTOMY AND THE APPLICATION OF RADIUM FOR CANCER OF THE LARYNX.

By DR. J. MOLINIÉ (Marseilles).

The cases were operated on under local anæsthesia aided by the hypodermic injection of morphine. The local anæsthetic—a solution of novocaine and adrenalin—was injected in the line of the incision and then at the level of the two branches of the superior laryngeal nerve. The advantages of local over general anæsthesia were as follows: Absence of risk from chloroform poisoning, greater rapidity of operation, more rigorous asepsis, less severe post-operative sequelæ. The application of the radium in the laryngeal cavity subsequent to the surgical ablation of the growth was for a period of three days in the one case and two days in the other. The immediate consequences were the prolonged wearing of the tracheotomy tube and the delay in healing. The remote consequences were as follows: In the graver case, in which the cancer was on the extreme verge of operability by thyrotomy, it had not recurred seven months later. The second case, less advanced, had also remained well. Although the cases were too few and too recent to permit of dogmatism on the value of radium, still, there was no reason why it should not be employed, even if the hopes based upon it were not to be realised.

DIRECT LARYNGOSCOPY WITH THE HEAD BENT IN THE TREATMENT OF CERTAIN FORMS OF LARYNGEAL TUBERCULOSIS.

By DR. CLAOUÉ (Bordeaux).

In tuberculosis limited to the juxta-arytæno-cricoid region the direct method alone can enable us to make a precise attack upon the disease. As soon as the tube-spatula has reached the entrance into the larynx, the author, instead of bending the head backwards, gradually bends it and the back forward.

FIXATION OF O'DWYER'S TUBES IN THE LARYNX ACCORDING TO THE METHOD OF POLVERINI AND ISONNI.

By DR. BONAIN (Brest).

Fixation of the intubation-tube is useful in cases where the surgeon is forced to leave his patient. The method of Polverini and Isonni (of Milan) is very simple. It consists in tying to the eyelet of the tube a silk thread passed by means of a large short needle through the thyro-hyoid membrane and emerging above the glottis out of the vestibule of the larynx. The thread, holding the tube in position, at its exit from the neck is rolled and fixed on a roll of gauze held in place by a circular bandage. The other end of the thread, issuing from the mouth, can be attached to the left ear. In an emergency the tube can be readily extracted by freeing the thread in the neck. In this way we can prevent two possible dangers—the expulsion and the sudden blocking of the tube. When the tube has to be worn for a protracted period vulcanite tubes are preferable to metal tubes because they do not require to be so frequently cleaned.

Dr. GAULT (Dijon) criticised the new suggestion as an unnecessary complication, the utility of which was not very evident.

THE TREATMENT OF ATROPHIC RHINITIS.

By DR. SIEMS (Mentone).

Vichy water is a useful douche, as it forms a soap with the ozænatous crusts. Penetrating the acini of the glands it liquefies their contents, which, by undergoing a sebaceous change, induce the factor of ozaena. Massage with a sound actuated by a motor and employing as a topical application balsam of Peru has the following effects: (1) A vaso-motor action, by exciting the nerve-terminals; (2) an abundant leucocytosis; (3) an action on the cavernous tissue; (4) evacuation of the contents of the distended glands; (5) a distal action on the accessory cavities, which dislodges the muco-purulent plugs. The treatment, by thickening the mucosa, facilitates the submucous injection of paraffin.

(D. M. trans.)

THE SEVENTEENTH INTERNATIONAL CONGRESS OF
MEDICINE IN LONDON, 1913.

The following are the President and officers of Section XV, Rhinology and Laryngology, at the Seventeenth International Congress of Medicine to be held in London in 1913:

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INTERNATIONAL CONGRESS OF MEDICINE AT BUDAPEST.

SECTION OF LARYNGOLOGY AND RHINOLOGY.

(Continued from p. 382.)

THE PROPAGATION AND CONTROL OF SCLEROMA.

BY DR. SCHRÖTTER (Vienna).

With regard to the possibility of infection, the author had recently seen a case in which there seemed to be no doubt of this occurring. In the way of treatment he advocated the use of pressure or dilatation. In order to remove vegetations and outgrowths radiotherapy in the form of the X rays had proved serviceable, and he demonstrated the apparatus he employed for the larynx. Generally speaking, efforts should be made to limit the spread of the disease in the community by means of notification, with timely control of the infected family, the avoidance of contact with healthy people as far as is practicable, etc. At the same time isolation as for leprosy was unnecessary. The governments of the countries where the disease prevails—Austria-Hungary, Russia, Germany and Italy—should be encouraged to adopt these measures and to further the scientific study of the disease.

THE DISTRIBUTION OF SCLEROMA IN HUNGARY.

BY DR. IRSAI (Budapest).

Dr. Irsai agreed with those writers who advocated compulsory notification and isolation of cases of scleroma. He exhibited a sketch-map of Hungary which showed that the disease was more extensively distributed than seemed to be the case in former years according to the old maps (Rona's). Goldzieher's and Neuber's experiments recently undertaken upon patients suffering from this disease were very welcome. By means of complement-fixation experiments, antibodies can be shown to exist in the serum of scleromatous patients. The technique of this is the same as that for the Wassermann reaction in syphilis. The reaction is specific, since the serum of the scleromatous patient does not give the positive reaction when, instead of an extract of the scleroma bacillus, that of related organisms like the Friedländer bacillus is employed. The reaction was positive in all cases save two, which had been for a long time under X-ray treatment. One of these cases, previous to the treatment, had given a positive response.

A CONTRIBUTION TO THE CLINICAL ASPECT OF SCLEROMA.

BY DR. NEUMANN (Vienna).

Cases of the disease in Chiari's clinique at Vienna were described, together with the treatment employed there.

DR. MAYER (New York) had collected sixteen cases of scleroma in

New York, most of them from his own clinique. He had found X-ray treatment very successful.

Dr. LUBLINER (Warsaw) had only seen one case out of thirty get well spontaneously. The case had been reported. The scleroma had disappeared after an attack of typhus exanthematicus (? true typhus fever). With regard to prophylaxis, he mentioned that he had never seen a case which came from a family in which other cases of scleroma existed.

Dr. BAUMGARTEN (Budapest) employed O'Dwyer's tubes in the treatment of scleroma, but he also taught the patient to introduce Schrötter's bougies for himself.

THE EPIDEMIOLOGY OF SCLEROMA.

On the motion of Dr. Schrötter a committee was appointed to deal with this subject and to report to the next Congress.

THE PATHOLOGY AND CLINICAL ASPECTS OF INNOCENT TUMOURS OF THE MAXILLARY ANTRUM.

By Dr. KAHLER (Vienna).

Two cases were described. The first was a periosteal fibroma; the origin of the second tumour could not be determined. The histological findings did not, like Bockenheim's case, suggest that this process was related to osteitis fibrosa.

CANCER OF THE LARYNX IN EARLY LIFE.

By Dr. MARSCHICK (Vienna).

Two cases from Chiari's clinique were detailed: (1) A man, aged twenty-five, with a tumour of the right half of the larynx proceeding from the vocal process; hemilaryngectomy was performed, but the patient died of septic mediastinitis. (2) A girl, aged sixteen, with the growth on the right vocal cord. Thyrotomy with removal of the vocal cord and ventricular band resulted in cure.

MICROSCOPIC SPECIMENS.

By Dr. SCHRÖTTER (Vienna).

The communication referred to the finding of an isolated lacuna in the medulla oblongata, corresponding to the nucleus of the vagus, from a man, aged thirty-six, who had suffered from tuberculosis together with symptoms of syringomyelia. In addition to paresis of the legs, partial diminution of muscular power, areas of anaesthesia, etc., dysphagia and loss of voice had existed. Clinical examination had revealed paresis of the left half of the palate, complete paralysis of the left vocal cord with twitching movements of the corresponding arytenoid cartilage. Diminished sensibility of the pharyngeal mucosa and of the mucous membrane at the entrance to the larynx were observed, together with well-marked thermal anaesthesia of the left half of the larynx. There was a corresponding absence of the laryngeal reflex. The *post-mortem* findings in the medulla explained the combination of unilateral laryngeal paralysis and anaesthesia. It was worthy of note that no symptoms referable to the glosso-pharyngeal (loss of taste) were present.

THE OPERATIVE TREATMENT OF MALIGNANT TUMOURS OF THE PHARYNX.

BY DR. CASTEX (Paris).

After describing the operative measures for the removal of malignant tumours of the soft palate, tonsils and pharynx, the author referred to the danger of extensive operations in consequence of shock, hæmorrhage and pneumonia.

THE OPERATIVE TREATMENT OF MALIGNANT TUMOURS OF THE NOSE.

BY DR. MOURE (Bordeaux).

A distinction should be made between tumours situated in the anterior third of the nasal mucosa (septum, floor of the nose, inferior or middle turbinal), and those growing from the upper parts of the nasal cavities and extending to involve the accessory sinuses. In the case of the former group, removal *per vias naturales* was feasible. With reference to the latter group the maxillo-nasal route, which the author had advocated for removal of the ethmoid, sufficed when the growth was limited to the ethmoid. When the tumour lay in the deeper parts of the nose, and when it grew from or had attacked the sphenoid, the trans-maxillo-nasal route proposed by him should be employed. In tumours of the antrum a more or less atypical resection of the upper jaw is unavoidable.

Dr. DENKER (Erlangen) had employed for some years for the removal of these malignant growths an operation which exposed the whole of the affected regions. He operated from the mouth through the antrum, keeping under the mucous membrane. This procedure was also recommended as giving access to the naso-pharynx in cases of innocent (fibromatous) and malignant tumours in that situation. In this way he had succeeded in removing a fibro-sarcoma which had not so far, two years after the operation, shown any signs of recurrence.

Dr. KOSCHIER (Vienna) employs the same skin incision as Moure. When, after removal of the corresponding part of the upper jaw, the tumour in the naso-pharynx is reached, he passes a stout drainage tube through the nose and fixed it round the base of the tumour. In this way the otherwise severe hæmorrhage from the tumour can be controlled. With regard to the results of these operations his experience had been that recurrence within a short space of time was inevitable. The prognosis in the case of angio-fibromata, however, was quite different. In opposition to views often expressed, he held that these growths never returned if their removal was complete.

Dr. MORELLI (Budapest) was of opinion that external operation did not afford any certainty of the radical extirpation of malignant tumours since the wound had to be closed up at once, and the bleeding was so severe that it was impossible to remove the whole of the growth. We ought to be able to keep the affected area under continual observation, and for this purpose a resection of the hard palate is essential. Proof of this was afforded by a patient he had exhibited.

THE RELATION BETWEEN THE SITUATION OF TUBERCULOUS AFFECTIONS OF THE LARYNX AND THAT OF THE PULMONARY DISEASE.

BY DR. JOUTY (Oran).

The author held that definite relationship existed between the pul-

monary and the laryngeal disease in respect of the side affected. This he ascribed to trophic inferiority of the one side as compared with the other. The inferiority was recognisable in unilateral neuro-muscular hyperæsthesia prior to the discovery of any laryngeal or pulmonary lesion.

THE TUBERCULOUS NATURE OF CERTAIN AFFECTIONS OF THE NOSE.

By DR. FARACCI (Palermo).

Eighty-seven patients were tested by means of the ophthalmo-reaction. Fifty-three of these were cases of ozaena, and thirty-four cases of ethmoidal suppuration; forty-seven reacted positive. The author concluded that either the tuberculin test was unreliable, or that there were pre- or para-tuberculous conditions which gave a positive reaction without showing the histological or clinical characteristics of real tuberculosis.

THE TREATMENT OF SYPHILIS OF THE NOSE AND LARYNX.

By DR. LAUTMANN (Paris).

For the destruction of the primary disease hot air was well adapted. Mucous tubercles were often uninfluenced by constitutional treatment and often disappeared after that treatment had been dropped. Potassium iodide was the most useful remedy for tertiary lesions. Mercury should be given by means of injections. He had seen several cases of syphilis of the upper jaw simulating simple empyema (? of the antrum).

SIMPLE WINDOW RESECTION FOR DEVIATION OF THE NASAL SEPTUM.

By DR. FEIN (Vienna).

The author recommended the formation of a large perforation in the septum instead of the usual submucous resection which was technically difficult, took a long time to perform, and was often insufficient.

Dr. FINDER (Berlin) criticised Fein's method as a retrogression. The making of a large perforation was often followed by long-lasting crust-formation.

Dr. KILLIAN agreed with Dr. Finder in regarding Fein's proposal as reactionary. With practice even severe cases could be operated on in from twenty to thirty minutes. On the other hand, he had seen large perforations accidentally produced which were not followed by any serious consequences.

Dr. RÉTHI raised the question of operating in early life. He had seen four children in whom the operation was followed by depression of the bridge of the nose. It would seem that the septum was necessary for the support of the bridge during the period of growth. For this reason operations on children should be deferred to a later age.

THE RELATIONS OF EPITHELIAL PEARLS OF THE PALATAL ARCH TO TUMOUR FORMATION.

By DR. DI COLO (Pisa).

The speaker drew attention to the ectodermal inclusions which were usually found in the lines of prolongation of the palatal plates, and which he had studied in serial section in embryos. He believed that pathological irritation of these inclusions tended to the production of tumours.

THE SIMPLE RADICAL OPERATION OF SOLITARY CHOANAL POLYPUS.

BY DR. LÁNG (Budapest).

Since Killian, in opposition to all other writers, had referred choanal polypi to the accessory sinuses, the speaker had carefully investigated six cases. In addition to the usual methods of examination, he had made an opening into the anterior wall of the antrum, and had examined the mucosa of the cavity by means of a short tube attached to an endoscope. Only in one case had he found the pedicle of the polypus fixed inside the antrum immediately above the ostium. In three cases the polypus was rooted in the middle meatus; in one the growth was attached to the posterior end of the middle turbinal, and in one to the floor of the nose. These results showed that operation upon these polypi should always be endo-nasal. He employed a sickle-shaped probe-pointed bistoury for cutting through the pedicle at its origin.

Dr. KILLIAN had given an exact definition of these peculiar polypoid outgrowths in his work, "*Ueber den Ursprung der Choanalpolypen*" (*Verhandl. des Vereins süddeutsch. Laryngol.*, Heidelberg, 1909). His experiences since then, involving as they did at least thirty cases, had thoroughly corroborated his earlier views. Besides that, Kubo and an Argentine observer had been able to demonstrate, by investigations both *post-mortem* and during life, that these polypi did actually take their origin inside the maxillary antrum. He regarded Láng's results as unreliable, since his method of examining the antrum did not permit of a free and unimpeded view of the whole cavity. It was, moreover, possible that Láng had been dealing with simple nasal polypi. With regard to treatment, there was, of course, no need to undertake radical operation on the antrum save when the choanal polypus showed a tendency to troublesome recurrence, or when there was concomitant suppuration of the antrum which had proved to be otherwise incurable. To tear through the polypus by means of a hook at the ostium was an ancient practice. It was much better, though doubtless more difficult, to snare the polypus and then to tighten the snare close up to the ostium before avulsing the pedicle.

(D. M. trans.)

(To be continued.)

Abstracts.

NOSE.

Honeij, Jas. A. Common Colds. "Boston Med. and Surg. Journ.," April 27, 1911, p. 604.

This original paper investigates the prevalence of common colds and the economic loss due to them. Fifteen thousand cards of investigation were sent out and resulted in 1633 cases of colds fit for careful study, although the total number of individuals with colds was 3,845, or, including the persons in the family affected with colds, 6,591. The whole paper is most interesting and should be read in its entirety. The summary is as follows: (1) Over half the population have colds during the course of the six months (December to June). (2) One fifth of the population are absent from work on account of colds. (3) The average loss of

time of 568 individuals was six days per six months. (4) The average loss of money was \$21 per six months, not including individual expenditures for medical treatment, etc. (5) The total loss in six months' time was \$12,105.37 for 568 individuals. (6) In addition to this there is a loss of energy equivalent to \$3 per six months per person. (7) The most common cold is the "head cold." (8) Most colds occur in the month of March. (9) Individuals from thirty to forty years of age suffer most from colds. Department store employées suffer most in proportion. Half of them lose time on account of colds. The author's conclusions are: (1) Preventive methods are essential in dealing with common colds. Better working conditions, pure air, even temperature, proper ventilation, and the proper amount of humidity are important factors. Nourishment, general hygiene, and proper clothing are necessary precautions as in guarding against all other disease. (2) After the onset of a cold, proper diagnosis is essential to ascertain whether the cold is infectious. (3) Individuals suffering from infectious colds should be isolated.

MacLeod Yearsley.

Gaudier, H. (Lille).—Voluminous Cyst of the Middle Turbinal, with Dermoid Contents. "Rev. Hebd. de Laryngol., d'Otol., et de Rhinol.," January 28, 1911.

The record of a case of a girl, aged fifteen, whose left nostril was obstructed by a large cyst of the middle turbinal. The only symptom complained of was inability to breathe through that side of the nose. The cyst was removed; it was found to contain a mass of sebaceous material, inodorous and sterile, composed of granular and fatty debris, with numerous crystals of cholesterine and epithelial cells. The cyst was lined with epithelium, partly columnar ciliated, and partly squamous.

Chichele Nourse.

Jay, Melville (Adelaide).—Asthma in Relation to the Nose. "Australasian Medical Gazette," May 20, 1911.

About 30 or 40 per cent. of cases of asthma if not actually caused by, are at least connected with, certain nasal conditions. In the majority of these cases there is present a hyperæsthetic area, most commonly, but not invariably situated on the septum. The bulbar nuclei of the fifth nerve are anatomically connected with the vagus, and in this way nasal irritation may excite reflex phenomena in the respiratory tract. By intra-nasal treatment a great many cases of asthma can be permanently cured. Polypi must be removed thoroughly with the diseased bone-cells from which they spring. Sensitive areas are then treated with the galvano-cautery.

J. Brady.

Blumfeld, J.—Nasal Reflex during Anæsthesia. "Proc. Roy. Soc. Med." (Anæsthetic Section), March, 1911.

Dr. Blumfeld recorded a case of sudden shock during the administration of chloroform and ether (2:3), in a case of submucous resection of the septum nasi; the anæsthesia was commenced with the patient horizontal and was still light (corneal reflex present) when the patient was raised almost into a sitting posture. About half to one minute later, while an injection of six drops of 1 in 4000 adrenalin was being made into the mucous membrane, the patient became very pale, and the pupils were found to be large and the cornea insensitive. Artificial respiration soon brought about recovery, and the operation was

completed under chloroform anaesthesia with the patient in the sitting posture.

In the subsequent discussion, Mr. A. D. Flemming, Mr. C. Carter Braine, Mr. L. K. Thomas, and Dr. W. J. Hewitt, and Dr. McCardie favoured the view that the sudden shock was due to the injection of adrenalin. Mr. Braine mentioned a case of tonsil removal under chloroform in which death occurred immediately after a small injection of adrenalin had been made on each side.

Dr. Probyn-Williams, on the other hand, thought the shock was due to the sudden change of position during the general anaesthesia.

Mr. Harold Barwell, who operated on the case, gave it as his opinion that the injection of adrenalin was responsible for the condition, although he had never seen any marked shock when adrenalin was injected in case of local or of ether anaesthesia. Mr. Harvey Hilliard reminded the section of Dr. Brodie's experiments on monkeys, which proved that stimulation of the nose and base of the skull produced even greater cardiac inhibition than crushing the testicle.

J. S. Fraser.

PHARYNX.

Holmes, E. M.—The Examination and Treatment of the Naso-pharynx and Eustachian Tube by Aid of the Naso-pharyngoscope. "Ann. of Otol., Rhinol., and Laryngol.," vol. xx No. 1, p. 31.

Emerson, F. P.—The Electric Naso-pharyngoscope. *Ibid.*, p. 41.

These are two short, but important papers. The value of the electric naso-pharyngoscope appears to be more recognised in America than in Great Britain. The instrument referred to in these communications is one invented, on the lines of the cystoscope, by Dr. Holmes. Judging from these authors, this method of examination is a very valuable one, as it enables the surgeon to ascertain and to treat directly the condition of the mucous membrane, the condition of Rosenmüller's fossæ, the mobility of the Eustachian tube, and the changes within its lumen for approximately five-eighths of an inch, the condition of the choanæ, vomer, and posterior pharyngeal wall, the condition of the larynx, and, in about 40 per cent. of cases, the condition of the sphenoidal opening, with occasionally a posterior ethmoidal cell.

Macleod Yearsley.

Faunce, Calvin B., Junr.—Acute Toxæmia caused by Infection of the Throat by the Colon Bacillus. "Boston Med. and Surg. Journ.," April 27, 1911, p. 613.

A woman suddenly developed headache, chilly sensations, lumbar and joint pains, followed in twelve hours by prostration and fever (103° F.). Throat red, greyish-white exudate on tonsils; became steadily worse, prostration being profound twenty-four hours from onset. Cultures negative for K.L. bacillus, but, on clinical grounds, 6000 units of antitoxin given. General improvement, but throat the same. Gradual improvement; throat normal in two weeks. All cultures negative for K.L. bacillus, but characteristic of colon bacillus (pure). Apparent improvement after antitoxin probably due to coincidental formation of antibodies.

Macleod Yearsley.

Freedman, L. M.—The Extirpation of the Tonsil by Enucleation, Partly Instrumental, Partly by the use of the Finger. "Boston Med. and Surg. Journ.," April 13, 1911, p. 535.

The author points out that tonsil enucleation is not a new operation, as it was described by Celsus in the year A.D. 10. The author's method is done in five steps: (1) Separation of the anterior pillar; (2) incision into the supra-tonsillar fossa; (3) finger dissection of the tonsil anteriorly and posteriorly; (4) snare engaged over the tonsil and tightened; and (5) handle of snare turned and tonsil gradually excised.

Macleod Yearsley.

Burack, S. M. (Charkoff).—Complications following the Removal of Tonsils and Adenoids. "Zeitschr. f. Laryngol.," vol. iii, Part V.

Of rather more than 2000 of these operations three were followed by severe and dangerous hæmorrhage from the tonsillar region. In each of them Matthieu's guillotine had been used. In most cases the simplest and most efficient method of arresting the bleeding is direct digital compression with sterile gauze. Instrumental compression, suture of the faucial pillars, their apposition by means of metal clips are theoretically excellent, but not always possible. In five other cases, rather severe bleeding took place from the adenoid area in children of from seven to thirteen years of age. Naso-pharyngeal tamponade is very rarely required in such cases. It is important to bear in mind that the trouble may be due to hanging remains of adenoid, and there should be no hesitation in removing these by a second curetting. Of 540 cases kept in bed after operation, 58 showed some rise of temperature during the first ten days.

Among other complications otitis media occurred six or seven times, chiefly in children with purulent rhinitis. In none of the cases could a direct injury of the Eustachian cushion be determined; the cause of the otitis was apparently an increase in the virulence of organisms already present as the result of the traumatism or the effusion of blood. The otitis took a favourable course in every case.

On the whole, the author considers, that in view of the serious or even fatal complications which may follow these operations, a somewhat more conservative standpoint should be adopted than is at present the case.

Thomas Guthrie.

LARYNX.

Woods, Robert H. (Dublin).—Carcinoma of the Larynx: Extirpation of Primary and Secondary Growths; Glandular Recurrence: Treatment with Thyroid Extract; Disappearance of Growths. "Brit. Med. Journ.," July 1, 1911, p. 5.

[A remarkable and striking example of the disappearance of established cancerous growths.] The patient, a man, aged fifty-one, came complaining of pain and difficulty of swallowing of two months' duration. A large ulcerated growth was found involving the right side of the larynx extending towards the pyriform sinus. No history of syphilis. Microscopic examination of a portion of the growth showed it to be a flat-celled carcinoma. Extirpation of the larynx was resolved upon. An autogenous vaccine of *Staphylococcus albus* and *aureus* with streptococci was administered as a

preliminary to operation. Laryngectomy on November 27, 1909. Recovery was retarded by severe hæmorrhage from near the base of the tongue between the fifth and twelfth days after operation, and by sluggish healing on the part of the external wound: granulations failed to form, the sutures cut out, and the tissues around the wound ulcerated away. Later on healing progressed rapidly and the parts cicatrised, leaving, however, as a result of the breaking down, a fistula between the trachea and the œsophagus. Attempts to close the fistula having failed, the author attached an inflatable rubber covering on the tracheotomy cannula, and this, inflated before a meal, blocked the opening so that the patient was able to swallow. At other times the existence of the fistula rendered it possible for the patient to speak "with quite a good voice." The glands over the right carotid sheath were removed on January 29, 1910. Examination showed that they were cancerous. No recurrence appeared until October 19, 1910, when a hard lump was felt on the right side of the neck at the level of the carotid bifurcation. Operation (October 22) showed the growth to be so extensive that removal was out of the question. A portion removed for microscopic examination proved to be cancerous. On the suggestion of Sir Chas. Ball thyroid tablets, gr. iij, three times a day were tried. On November 22 a fluctuating swelling to the right of the tracheal opening was incised, and some curdy, whitish matter (not pus) was let out. This wound gradually closed, but the material accumulated again, and the swelling was again opened. In the first week of January, 1911, it closed finally. On January 24, 1911, it seemed to the author that the glandular tumour was rather smaller. A month later this had become unmistakable, and the patient expressed himself as free from pains which had previously been troubling him. The tumour continued to diminish, and six months after the thyroid treatment had been started "no evidence of tumour could be felt." Sir Thornley Stoker then saw the patient in consultation, and the thyroid treatment was continued.

The author notes that the only cases in which this treatment has been successful have been lymphatic recurrences after extirpation of the primary growth.

Dan McKenzie.

Levinstein (Berlin).—On the Difficulty of Making the Diagnosis of Paralysis nervi recurrentis rheumatica and the Value of Examination with Rontgen Rays. "Arch. f. Laryngol.," vol. xxv, Part I.

In this paper a general review of the subject is given, and especial stress is laid on the writer's opinion that a diagnosis of rheumatic recurrent paralysis should never be made without the assistance of an X-ray examination. In a case which he relates, both the history and the physical examination pointed to rheumatic paralysis as the correct diagnosis, but a radiograph disclosed the presence of an aneurysm. It is probable, therefore, that a considerable number of the cases reported in the literature as "rheumatic" were incorrectly so described.

Thomas Guthrie.

EAR.

Mayer, Otto.—On the Causation and Ætiology of Otosclerosis. "Monatschrift f. Ohrenheilk.," Year 45, No. 4.

After a critical allusion to past and recent literature on the subject

the author describes his experience of the disease from both a clinical and histological point of view in a long article which is well worth attention. He lays great stress on the fact that the foci of disease correspond in their situation to the immediate environment of the terminal arterioles, and would thus regard the lesions as having a very definite relation to vaso-motor disturbances.

He submits that the scanty secretion of cerumen and sweat and loss of susceptibility to tickling in the outer ear passage, as have been noted in these cases, all go to support this contention. Such vaso-motor disturbances may of course be the result of many and varied conditions or events, but that they have an influence on the production of the disease Mayer is able to quote *post-mortem* evidence and also observations made as regards the state of the circulatory system during life. With respect to trauma, he considers that it is quite possible for otosclerosis to be so produced on the grounds that atheroma may also be dependent on the same agency. Though containing nothing, perhaps, that can be characterised as new, the paper forms such a masterly *resumé* of his own accurate research and current opinion that one hopes the author in the near future will in addition give us his views as to the treatment of the disease.

Alex. R. Tweedie.

Mayer, Otto.—A Histological Report of a Case of Otosclerosis. "Monatsschrift f. Ohrenheilk.," Year 45, No. 3.

A very detailed and accurate account of an examination conducted on a case of this disease which occurred in a man who died at the age of 57, having been deaf for some twenty one years, and who had suffered from attacks of giddiness and tinnitus. His mother, who had died before him, had also been deaf twenty-three years. The description and discussion of this case in particular and of the condition in general covers some twenty-four pages, in which eleven illustrations are included. Death was due to "pulmonary oedema, dilatation and fatty degeneration of the heart, chronic enlargement of the spleen and general anaemia." The account and views of the author do not materially differ from preceding similar descriptions of other observers, yet it forms one more most valuable record of the pathological data of this obscure disease, and in addition allusion is made to the importance of both examining other portions of the skeleton in such cases—although this does not appear to have been carried out in this instance—and also of investigating the aural conditions in patients the subject of arthritis or osteitis deformans. Research in this direction has always seemed to have been much neglected, and it is quite possible that valuable light may be thrown on the aetiology of the disease by these means.

Alex. R. Tweedie.

Barck, C.—A Case of Brain Abscess with Rare Ocular Symptoms.

"Ann. of Otol., Rhinol., and Laryngol.," vol. xiv, No. 1, p. 1100.

The brain abscess followed left middle-ear suppuration. It was accompanied by complete right homonymous hemianopia and choked disc in both eyes. The left eye, in addition, showed two large hemorrhages close to the optic papilla. Exploratory operation failed to find the abscess, but the left eye improved after the relief of pressure. The patient died about one month later, with amnesic aphasia followed by coma. *Post-mortem*, an abscess was found in the extreme postero-superior part of the temporal lobe.

Michael Yonckley.

Halász, H. (Miskolcz).—Extra-dural Abscess following Primary Mastoid Osteitis. "Arch. f. Ohrenheilk.," Bd. lxxx, Heft 1 and 2.

The patient was a male, aged four and a half. During the third week of an attack of whooping-cough pain in the right ear and mastoid process was felt. There was no discharge from the meatus, but a few days before Halász saw the patient the mastoid became swollen. On examination there was found a doughy, tender fulness over the mastoid process, very tender to the touch. The membrana tympani was dull, but manifested no bulging nor any other sign of acute inflammation. The hearing was but slightly affected; watch heard at $1\frac{1}{2}$ metres, whisper at 6 metres. Temperature 37.6° F. At the operation, pus, under pressure, was evacuated from the mastoid cells, and the whole process was seen to be diseased. The lateral sinus groove contained pus and the sinus was covered with granulations. Recovery. *Don McKenzie.*

Graham, H. B.—Concerning the Capsulated Bacteria in the Production of Acute Middle-ear Affections. "Ann. of Otol., Rhinol., and Laryngol.," vol. xix, No. 4, p. 1617.

The author considers that the work done upon this subject is of sufficient importance to warrant a review. Of the capsulated bacteria (*pneumococcus*, Friedländer bacillus, *Streptococcus mucosus*), the second seems least frequently, the third most often, observed. *Pneumococcus* is more common in children, *streptococcus* in adults. The article is a useful review of work done, with the addition of three cases from the Urbantschitsch Clinic, at Vienna, which well illustrate the course of the disease due to the capsulated bacteria. *Macleod Yearsley.*

Haskin, W. H.—A Report of a few Cases of Otitis Media Suppurativa Treated with Suspensions of Lactic Acid Bacilli. "Ann. of Otol., Rhinol., and Laryngol.," vol. xx, No. 1, p. 49.

Seventeen cases tabulated. The meatus was syringed with warm saline and dried, the suspension of bacilli then being instilled and retained for fifteen minutes. Fresh cultures are required. *Macleod Yearsley.*

Kopetzky, S. J.—The Present Status of Labyrinth Surgery. "Ann. of Otol., Rhinol., and Laryngol.," vol. xix, No. 4, p. 994.

The author presents the present status of labyrinth surgery from the personal standpoint, based upon seven cases, of which five died. In a number of other cases which showed clinical signs of labyrinthitis, recovery followed the radical mastoid operation. The author insists that laboratory findings are no index to the character of the disease. He classifies labyrinthitis as: (1) Infection from acute middle-ear disease. (2) Infection from exacerbation of chronic middle-ear disease. (3) Traumatic (hemorrhagic and infectious). (4) Infection from chronic middle-ear disease without acute exacerbation. A discussion of the symptoms, diagnosis, and indications for operation follows. The caloric test is considered to be dangerous, and it is insisted that absolute or even probable diagnosis is impossible before exploratory operation, under present conditions. The author agrees with Scheibe that suspicious symptoms should be treated by immovable rest in bed, careful watch being kept for meningeal symptoms. Operations on the labyrinth are summarised, and the paper concludes with remarks on technique. *Macleod Yearsley.*

SALVARSAN IN SYPHILIS.

Benario, J. (Frankfurt-a-M.).—The Frequency, Causation and Therapeutics of Neuro-recurrence after Treatment by Salvarsan a Statistical Inquiry. "Münch. med. Wochens." No. 14, April 1, 1911.

In this interesting paper the problem of neuro-recurrence (neuro-rezidive) in the form of affections of certain cranial nerves occurring in the course of acquired syphilis and its bearing upon the use of "606" is fully discussed. Besides being of great general interest, the question is important from the otologist's point of view, as the eighth (auditory) nerve is most frequently the seat of the lesion. Dr. Benario has collected particulars of 126 cases of neuro-recurrence from 14,000 cases of syphilis treated by "606," and his statistics show that 118 of these occurred in the primary or secondary period, but particularly in the early secondary period. Neuro-recurrence may, therefore, be regarded as a complication of the early stages of syphilis. The cranial nerves affected were the second to the eighth, the latter being the most frequently involved (43 per cent.), the optic nerve coming second with 26 per cent., and the facial third with over 15 per cent., the other four being much less frequently implicated. The affection was more often unilateral, and either isolated or in combination with an involvement of one or more of the other six nerves. In the fifty-one cases in which the eighth nerve was implicated, the cochlea alone was involved twenty-nine times, the vestibular organ five times (thrice unilaterally), and both cochlea and vestibule seventeen times. In a footnote attention is drawn to Röthig's work upon the toxic effect of arsacetin upon the cranial nerves, in which it is shown that when the auditory nerve is affected, it is only in its vestibular portion and always on both sides.

In 96 per cent. of the cases the neuro-recurrence occurred within four months of the salvarsan injection, the second month being responsible for the largest number (40 per cent.). The author thinks the frequency of neuro-recurrence following treatment by salvarsan is more apparent than real, as owing to the closer study and observation of cases treated by this method such nervous manifestations are less likely to escape notice. Also the technique and dosage in the administration of a remedy which is new must, in many instances, be uncertain and inadequate. The important question as to whether these affections of cranial nerves are toxic (arsenical) in origin, or the result of a definite syphilitic process, is discussed very fully. Dr. Benario agrees with Ehrlich in attributing the neuro-recurrence to the latter and not to any neuro-tropic action of the drug for the following reasons: (1) The long interval between the injection of the drug and the occurrence of the nervous manifestations. (2) The character of the manifestations; these are more of an irritative or inflammatory nature as compared with the atrophic changes seen after other arsenical preparations (arsacetin). (3) The affection practically always occurs during a definite period of syphilis (early). (4) Such nervous phenomena have not been observed to follow the use of "606" in non-syphilitic diseases. (5) The beneficial effects upon the neuro-recurrence of mercury, or a further injection of "606." (6) The recurrence has in a very large proportion followed treatment by small (inadequate) doses of "606." (7) It has been shown that similar manifestations have followed treatment by mercury.¹

¹ Benario in *Münch. med. Wochens.*, No. 1, 1911.

The explanation offered by Ehrlich and supported by Benario in this paper of the occurrence of neuro-recurrence is based upon the assumption that the treatment has not been sufficiently effective, and that isolated clumps of spirochaetae, situated in the sheaths of the cranial nerves, have escaped the action of the drug, and have set up a strictly local lesion (perineuritis) without causing a general toxæmia, thus explaining the frequency in such cases of a negative Wassermann reaction. As the result of this statistical inquiry, Dr. Benario has been able to bring forward certain important facts bearing upon the prevention and treatment of such recurrences: (1) The early secondary stage is the dangerous period. (2) Cases where the primary lesion is extra-genital, especially the type known as chancres cephaliques, are more liable to neuro-recurrence. (3) Cases where the cutaneous eruption is of the papular variety are also more prone to such complications. (4) Headache, vertigo, tinnitus and disturbances of vision are important prodromal symptoms. Bearing these facts in mind Dr. Benario urges (1) that treatment, especially in the early secondary stage, should be thorough and energetic; (2) that "606" should, when possible, taking contra-indications into consideration, be administered by the intra-venous and not by the subcutaneous or intra-muscular method; (3) that the dose should not be too small, and should be followed in three or four weeks by a second injection; (4) that during the intervening period mercury should be pushed. Further, the patient should be warned to return at once on the appearance of the prodromal symptoms. The treatment of the neuro-recurrence itself consists in the energetic use of salvarsan or mercury, and the results are generally good unless, owing to undue delay, permanent degenerative changes in the nerves have occurred. Dr. Benario's paper is of special interest to otologists as indicating the much greater frequency than has hitherto been supposed of early syphilitic disease of the auditory nerve or labyrinth. Mention is made, in a short supplement to two articles bearing on this subject by Meyer and Frey, which appeared in the *Wien. klin. Wochens.*, No. 11, 1911. In a *post-scriptum* twelve additional cases of neuro-recurrence are briefly reported; in three the optic nerve was affected, and in nine the auditory nerve (vestibular and cochlear branches five times, vestibule alone twice, and cochlea alone twice).

J. Stoddart Barr.

Desneux and Dujardin (Brussels). - Neuro-recurrence after the Treatment of Syphilis with Salvarsan. - *Münch. med. Wochens.* No 23, June 6, 1911.

The authors publish particulars of six cases of neuro-recurrence out of 350 cases of syphilis treated with "606." In two of the six there was implication of the auditory nerve along with facial paralysis. The authors' conclusions agree most strikingly with those of Benario, and therefore need not be repeated. They believe that neuro-recurrence is entirely a syphilitic manifestation, due to localised meningitis, and that the cause is to be found in an insufficient dose of "606" defectively administered. They recommend in all primary and secondary cases the intravenous injection altogether of from 1.5 to 3 gr. of Salvarsan. In a short supplement the authors briefly describe a seventh case, following the administration of "606," of neuro-recurrence, in which the cochlear and vestibular branches of the right auditory nerve were implicated.

J. Stoddart Barr.

Gander, Prof. H., and Guggenheim, H. Aural Complications arising during the Treatment of Syphilis by Organic Arsenical Products. "La Presse Médicale," June 17, 1911.

In this article the relative toxicity of the various arsenical compounds is discussed, especially with reference to their incidence on the eighth nerve. The writers remark that the neuro-toxic effects of these agents, recently adopted in the treatment of syphilis, varies considerably. No otitic trouble has arisen from the administration of cacodylate or methyl-arsenite of sodium, even in very large doses. Ehrlich's experimental investigations go to show that the toxicity of atoxyl, arseno phenylglycine and arsacetine for the cranial nerves is considerable, whilst that of salvarsan is almost *nil*; white mice injected with the latter suffered no toxic effects, but injection of the former compounds induced disturbance of orientation attended by movements resembling those of Japanese dancing-mice. Two cases of aural affection attending the use of "606," observed by M. André Castex, are quoted:

(1) Three injections were administered to a man, aged thirty-three, at intervals of two months. Ten days following the third administration he complained of pains in the head and both ears, especially violent in the right, from which there was a slight discharge of blood. Examination revealed complete deafness of the right ear and partial of the left. The right membrana tympani was congested and ecchymosed, the left was slightly reddened. Both labyrinths were inflamed.

(2) In the case of a tertiary syphilitic suffering from otitic sclerosis of long standing, the deafness rapidly increased after injection of "606," and violent tinnitus set in at the same time. Benario, in some recent statistics, found that of 126 cases of nerve-lesion arising during treatment by salvarsan, the auditory nerve was involved in fifty-seven. Finger, Rille, Beck, Urbantschitsch, Levy, Herzfeld and others have had a somewhat similar experience. The lesions usually appear during the first four months succeeding the injection, sometimes very early, but especially two months afterwards. The auditory nerve is more frequently inflamed, the cochlear branch alone being involved, but the vestibular nerve may also be affected and sometimes by itself. The labyrinth trouble may or may not be accompanied by inflammation of the middle ear. Clinically there is unilateral or bilateral deafness with tinnitus. Rinne is positive; auditory acuity is much impaired. Perception for the watch and acoumeter is lessened or even abolished. The upper tone-limit is lowered. Vertigo may be present, indicating the participation of the vestibular nerve in the pathological process; in cases of isolated neuritis of this nerve there are marked vertigo, disordered equilibration and nystagmus, with normal hearing. The prognosis is favourable, most cases recover spontaneously, though not always completely, in from several weeks to months.

Three cases of aural complication during treatment by hectine are also recorded.

H. Clayton Fox.

Avellis, Georg (Frankfurt-a-M.). Salvarsan in Laryngology. "Zeitsch. f. Laryngol.," Bd. iii, Heft 5.

The writer has had no trouble with his cases of intra-muscular injection of "606"; he injects deeply into the shoulder muscles. With regard to intra-venous injection, he thinks it best to expose the vein by incision. Case 1: Primary sore on tonsil healed in ten days. Case 2: Leukoplakia and rupia healed in three weeks; this case had resisted iodide and mercury for six months. Case 3: Failure in a case of small-cell sarcoma

of tonsil and palate. Case 4: Failure in case of tabetic paralysis of posticus. Friedländer and Mickley report good results in secondary syphilitic lesions of mucous membranes. Disease of the optic and also of the auditory nerve has been observed after "606." Ehrlich believes that these troubles are due to the fact that nerves are badly supplied with blood, so that the spirochaetes cannot be acted on by the drug.

J. S. Fraser.

Safranek, J. (Budapest).—Arsenobenzol in Syphilitic Diseases of the Upper Air-passages. "Zeitsch. f. Laryngol." Bd. iii, Heft, 5.

Most arsenical preparations are not only toxic to the spirochaete (parasitotropic) but also to the host (organotropic). Salvarsan is parasitotropic without being organotropic. The drug acts well, not only in cases of primary sore, mucous patches and condylomata, in which the organisms are present in large numbers, but also in cases of tumour-formation and ulceration in which they are absent or scanty: the remedy also is very beneficial if given to the mother before the birth of a child—probably on account of the liberation of endotoxin. Occasionally it fails to act, while in other cases there is a return of the disease. The Wassermann reaction may remain positive after the drug has been given.

Safranek reports on twenty-five cases: (1) Tertiary ulcer of septum nasi, intra-muscular injection: cure in seven days. (2) Gummatous abscess of nasal bone, ozena: incision of abscess, subcutaneous injection of "606," high temperature, cure in ten days. (3) Ozena, ulcer of nasopharynx, epiglottitis and cords swollen and red: intra-venous injection, burning pain in neck and ear, cure in twelve days. (4) Papular eruption in pharynx and mouth: subcutaneous injection, marked local reaction, cure in five days (seven similar cases were successfully treated). (5) Ulceration of tonsils and fauces (four cases): cure in four or five days after injection. (6) Erythematous affection of pharynx and larynx: also reacted promptly to "606." (7) Tertiary disease of the pharynx (five patients): four of these were cured, but in one the injection did no good. (8) In one case of combined tuberculosis and syphilis of the larynx the result was fairly good. Salvarsan has a favourable action in cases of syphilitic ozena. As a rule, there is a marked local reaction twenty-four hours after the injection in addition to the general reaction: the patient complains of a burning feeling in the part affected. *J. S. Fraser.*

Gerber (Königsberg).—The Effect of Salvarsan on Syphilis of the Upper Air-passages, Scleroma, Plaut-Vincent's Angina, and Scurvy. "Arch. f. Laryngol." vol. xxiv, Part II.

In the author's earlier cases the drug was given by Wechselmann's intra-muscular method, in the later by Schreiber's intra-venous method. Comparing the two, he considers the intra-venous the more disagreeable at the time, but the less so afterwards. In two cases of intra-venous injection collapse occurred, and in five out of nine cases shivering, vomiting, and diarrhoea. He, however, regards the drug as absolutely harmless if properly used. Of the twelve syphilitic cases, the most remarkable was one of laryngeal stenosis, which had for three years resisted treatment by mercury and iodides and dilation with bougies. Four days after the injection all respiratory obstruction vanished, and the glottis became quite normal in appearance. In eleven of the twelve syphilitic cases all signs of the disease were absent in from three to fourteen days after the injection, while in the twelfth (a nasal case with sequestrum), healing was complete in six weeks. The two cases of Vincent's angina and the one

case of scurvy were healed in from three to five days after injection. The case of scleroma remained unaffected.

The author regards salvarsan as the best and most rapid remedy for diseases due to spirochaetes, especially, of course, syphilis.

Thomas Guthrie.

Bunch, J. L.—**Case of Congenital Syphilis Treated by "606."** "Proc. Roy. Soc. Med.," May, 1911 (Section for the Study of Disease in Children.)

At the age of three weeks the child suffered from rhinitis, which developed into "snuffles"; later a papular eruption and mucous tubercles developed. Salvarsan (0.04 gm.) was injected in the scapular region; this was followed by a rise of temperature and local swelling. A fortnight after the injection the mucous tubercles and snuffles had disappeared, but the Wassermann reaction was still positive ten days later.

J. S. Fraser.

REVIEWS.

The Deaf Child: A Manual for Teachers and School Doctors. By JAMES KERR LOVE, M.D. Bristol: John Wright & Sons, Ltd. London: Simpkin, Marshall, Hamilton, Kent & Co., Ltd., 1911.

The present reviewer casually opened this work with a view to skimming over a few pages before passing it on to a more capable analyst. He found himself so attracted that he read every page with the greatest interest, profit, and pleasure. Dr. Kerr Love produces many facts and figures, and from them elaborates certain principles which cannot fail to appeal to every reader. His main contention is that too much consideration has always been given to the "system," whether oral, manual, or sign, and too little to the "deaf child" as such. He takes up a judicial position, and looks fairly at the defects and failures as well as at the excellencies and the triumphs of each system. The oral system is, of course, the ideal one, and it is not surprising that it should have inspired an enthusiasm leading to more zeal than discretion in its use. Unfortunately it has its limitations, and Dr. Kerr Love, while one of the keenest of its supporters, indicates where these are to be reached. All interested in the "deaf child" must read this informing work.

D. G.

Handbuch der Speziellen Chirurgie des Ohres und der oberen Luftwege. Herausgegeben von Drs. L. KATZ, H. H. PREYSING, and F. BLUMENFELD. Würzburg: Curt Kabitzsch, 1911.

We have received for review part of the first volume of this large work which is in the process of publication. Parts I-V of volume I are before us and it is evident from the table of contents that a very comprehensive account of the anatomy and surgery of the ear and the upper air-passages is promised us. The names of Katz, Preysing and Blumenfeld are a sufficient guarantee that the work will be carefully edited.

Parts I and II furnish a descriptive account of the topographical anatomy of the head, exclusive of the nasal cavities and the ear, and is from the pen of J. Sobotta, Professor of Anatomy in Würzburg. It is undoubtedly of advantage to the surgeon in this field to-day to be able to refer to anatomical points in connection with the brain and the cranial

nerves without the necessity of consulting a text-book of anatomy, and consequently the introduction of such a chapter as that with which we are now dealing gives additional value to the treatise. We are of the opinion, however, that the association of a clinician with the anatomist would have increased the value of this section.

Parts III, IV, and V deal in great detail with the anatomy of the nasal and accessory nasal cavities; it seems only natural to expect them to be written by Professor Onodi, of Budapest, than whom no one is more competent to do so. To those already acquainted with Onodi's work what is here written and illustrated will be familiar, as it is mainly a reproduction of his already well-known atlas; consequently a review in detail at this date hardly seems called for. The illustrations form a striking feature of the text-book, and if the same standard is to be maintained in the clinical volumes as in the anatomical introduction they will greatly add to the value of the publication, and we look forward with interest to their appearance.

A. Logan Turner.

NEW INSTRUMENT.

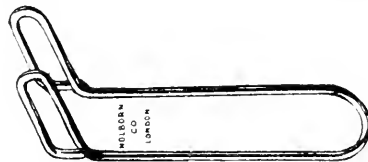
A SIMPLE NASAL SPECULUM.

By JAMES DONEGAN.

Surgeon to the Throat Department, Italian Hospital, London.

The nasal speculum shown in the adjoining cut was copied from one made from a hair-pin in an emergency.

The wire is bent in such a way that the loops forming the blades



support themselves without soldering. The speculum is efficient, sterilisable, and costs only sixpence. It is made by the Holborn Surgical Instrument Company, and will be found useful in out-patient work or wherever a ready succession of fresh instruments is required.

BOOKS RECEIVED.

Diseases of the Nose and Throat, Comprising Affections of the Trachea and Oesophagus. A Text-book for Students and Practitioners. By *StClair Thomson*, M.D., F.R.C.P.Lond., F.R.C.S.Eng. With 18 plates and 294 figures in the text. London, New York, Toronto, and Melbourne: Cassell & Co., Ltd., 1911.

Der Schwindel (Vertigo). By *Dr. E. Hitzig*. Zweite Auflage von *J. Rich. Ewald*, und *Robert Wollenberg*. Strassburg. Mit 12 Abbildungen. Wien und Leipzig: Alfred Hölder, 1911.

Handbuch der Speciellen Chirurgie des Ohres und der oberen Luftwege. Herausgegeben von *Dr. L. Katz*, *Dr. H. Preysing*, und *Dr. F. Blumenfeld*. Bd. i, Hälfte 1, Lief 6, und Bd. i, Hälfte 2, Lief 1.

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RADIUM IN DISEASES OF THE NOSE AND THROAT.

BY T. G. OUSTON, F.R.C.S.ENG.,

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THE advent of any notable new remedy seems usually to be marked by three phases: The first in which it is considered a marvellous cure to supersede all the older orthodox remedies, and is puffed by the daily halfpenny papers. The second when the pendulum has swung the other way and it is condemned as useless or dangerous. The third when it finds its true place in clinical medicine or surgery. Radium is no exception to this rule, but it has been longer than most other remedies in having its merits or demerits found out. It has been before the medical public now for seven years, has been extolled by leaders of the profession in some instances, ignored or slighted in others, and is only now just beginning to fill its proper corner in therapeutics.

Information as to the clinical value of radium has thus been more slowly obtainable than that of most new remedies, the chief reason of which is its cost, and, perhaps, to a less degree the rivalry of the somewhat older and better established treatment by X rays. The action of the two differ from a clinical as well as from a scientific point of view in many respects, although they have points in common. Even were the clinical and therapeutical actions of the two the same, it is at present impossible to apply

X rays to the mucous membranes of cavities such as those of the nose, larynx, œsophagus, rectum, etc.

I have not enough experience of X rays, and also, I may say, of radium, to contrast the action of the two effectively, but it is now well known that clinically their curative action has some similarity in that they are both effectual in two important diseases, viz. lupus and rodent ulcer.

I have devised a radium applicator resembling a small laryngeal mirror of oval shape; radium paste is present instead of the mercury of the mirror, and instead of the glass a layer of varnish protects the paste. The shaft is made of pliable metal, enabling the instrument to be bent to adapt itself to follow the sinuosities of the nasal cavities, or be applied to the epiglottis or larynx itself; in the latter case a handle is screwed on to the shaft, in the former the shaft only is used.

The paste contains one centigramme of radium bromide transformed into sulphate equal to $2\frac{1}{2}$ mgrm. of pure radium, the activity of which is represented by the makers at the figure 500,000. The salt can also be obtained in activity represented by the figures 50,000 and 10,000, but these degrees of activity would, I think, be inconveniently slow in their action. The head of the instrument has been made as narrow as possible to adapt itself to the often very narrow passages of the nasal cavities, but even so, I wish it could be narrower. Owing to the shield of metal on one side of the paste, the apparent activity of the radium is far greater on the varnished side if luminosity is any criterion. The intensity of the luminosity can be demonstrated in a pretty manner by placing a diamond on each side of the head of the instrument at equal distances—both diamonds glow with much more intensity than the radium itself, but the one on the varnished side is much brighter than the other. Three sets of radiations of different qualities and penetrating power have been demonstrated, known as the *alpha*, *beta* and *gamma* rays, in addition to a gaseous substance, the so-called emanations; and the *gamma* rays are said to be capable of penetrating a 12in. steel plate or an inch of lead. I am indebted to Dr. Martin, of Messrs. Brady and Martin, for obtaining the radium, and having it mounted in the holder according to my ideas.

In order to keep the instrument clean in the moist cavities in which it has to be used, a piece of gutta-percha tissue is folded round the head, and fastened round the stem with cotton; this may be more efficiently done with chloroform if care is taken that the chloroform does not penetrate to the varnish.

After keeping the radium some time the varnish is apt to rise in the form of a blister and increase the breadth of the head to an inconvenient degree. The instrument has had to be returned to Paris for this reason. The makers state that it is due to the radium emanations, and say that it is only necessary to prick the varnish with a needle for the blister to subside; in trying to do this, however, the varnish cracked across. It would be an uncomfortable event for both patient and surgeon were the paste to drop into a cavity like the post-nasal space and be swallowed; but the gutta-percha tissue guards against such a possibility.

My first experiment was to apply the radium to the healthy skin of my forearm for half-an-hour. (I may here say that the action of radium gives no sensation of any kind, either at the time of application or after). Nothing could be detected for the first thirty-six hours, but at the end of this time a very faint pinking of the surface corresponding to the area of the paste made its appearance. This increased in intensity for six weeks, when it was visible in a good light at a distance of 12 feet. At the end of ten weeks the effects of the application appeared to reach their maximum intensity. The colour then was of a somewhat purplish hue, and the surface was covered with a slight scaliness, which disappeared in a few weeks more. The colour gradually changed to a yellowy-brown, also becoming fainter, until now, at the end of one year, the place is almost invisible.

CASE I.—This case is a most interesting and instructive one, as affording a demonstration of the convenient utility of radium in general, and (may I be excused for saying) my instrument in particular, showing how in a suitable case and tolerant patient, awkward places such as the post-nasal spaces, orifices of the Eustachian tubes, the epiglottis, and even the larynx may be reached and treated.

A lady, aged about thirty-five, had suffered from lupus vulgaris of the face since girlhood; originally treated by senaping, the advent of the X rays afforded a cure to this part of her trouble. One year ago she was recommended to see me by Dr. Taylor, of Chester-le-Street, on account of nasal discharge and obstruction, etc. Her nose was filled with crusts and pus, the removal of which caused bleeding and left a roughly granular surface extending over the whole of the surfaces within view in both nasal cavities. The condition caused great discomfort, especially during the night. The post-nasal space was in a like condition, and a granular overgrowth covered the mucous membranes surrounding the orifices of the Eustachian tubes. There was considerable loss of hearing and a history of intermittent discharges from both ears. The membrane tympani were perforated. The epiglottis was reddened and also covered with granular overgrowth. The larynx generally was hyperemic, and the upper portion of the

tracheal mucous membrane showed several distinct granules. Behind the left posterior pillar of the fauces there was a considerable mass of lupoid tissue. The radium was applied to a part of the diseased mucous membrane of the nasal cavities within sight. The time it was in contact with any one area of membrane varied from twenty minutes to one hour, several of these areas being usually treated at one sitting. In many parts the instrument was self-retaining, and the patient was able to read or sew. At other times, however, it was necessary for her to hold it in position with her elbow supported. Some of the areas required repeated applications. The orifices of the Eustachian tubes and post-nasal space generally were reached by passing the holder in the same manner as a Eustachian catheter. By using the post-nasal mirror the radium could be directed into accurate contact with the mouths of the Eustachian tubes or other part of the epi-pharynx. For treatment of the epiglottitis the handle was screwed on to the stem, which was bent to a laryngeal curve, and after the laryngeal surface had been cocaineised the radium was gently placed in contact with this part, and the patient, closing the teeth and lips on the holder, was able with a little practice to retain it in this position for ten minutes at a time without removal. Closure of the mouth seems to lessen the tendency to gagging, as is also shown in the use of the new instrument—the pharyngoscope. In treating the larynx I was able after cocaineisation to keep the radium just anterior to the arytenoid region for a few minutes at a time, but I had to hold the instrument in position myself. The total amount of time during which the radium was in contact with some part of the mucous membranes just mentioned amounts to sixty hours, spread over a year of treatment. The results were as follows: The crusts in the nose began to diminish almost at once, and after a few hours' treatment extending over one month the mouth was kept closed during the night. The present condition is that the nostrils are about normally patent, but a small amount of sealing still takes place from a few parts of the surface. The membrane is paler and somewhat wizened-looking, and gives one the impression that the cilia have been destroyed. This I attribute to the action of the disease and not to the action of the radium, as the disease was very advanced before treatment was begun.

In this connection one has to remember that the mucous membrane of the nose differs from that of the skin in that if the germ-cells of the epidermis are destroyed scar tissue takes its place, which, apart from a somewhat altered appearance, does not matter very much from a functional standpoint. In the case of the mucous membrane, however, if the cilia are annihilated a condition of stasis is established, and the discharges from the sinuses are retained on the affected part. In other words, a condition analogous to atrophic rhinitis is present.

The epiglottitis improved almost at once, which may have been due to the local action of the radium, but probably also I think to the improved nasal condition. The granular condition in the epi-pharynx required about twelve hours' treatment. The one unsatisfactory part in the case is the condition of the middle ears, which have a staphylococcal infection, and are much worse than they were a year ago. I am considering the question of applying a tiny piece of radium through the Eustachian catheter to the tube, and perhaps through the perforation in the membranes to the middle ears.

I have applied radium to three cases of ordinary perforation of the front of the nasal septum, the edges of which would not heal. In each case benefit seemed to result in the course of a week or two. All the cases were hospital ones, and disappeared from observation.

CASE 2.—A man was sent to me from Sir Rudolph Smith, of Stockton, with a specific tongue, which had a very painful ulcer on the dorsum. This was given a three-quarter-hour dose of radium. Three weeks later Sir R. Smith wrote: "I saw Mr. X — again yesterday and found the ulcer on the tongue practically healed. The cicatrix looked very healthy, and another important point was that ever since the application there has been an entire absence of pain. He states that even within a few minutes of the sitting being over, the pain ceased and has never returned; . . . so far I can only speak of the remedy as an unqualified success." Twelve weeks after the application he reported: "Mr. X —'s tongue continued to remain very well until a week or so ago, when it began to be a little sore, but he had been leaving off his medicine."

CASE 3.—An elderly man was seen with Dr. O'Neill, of Jarrow, suffering from an epitheliomatous growth at the base of the tongue, just in front of the epiglottis; a large mass of secondary glands was also present in the neck. Radium was applied to the primary growth, which was painful. I only used the radium as a placebo at the request of the patient's doctor, as the case was hopeless. The patient stated that the applications relieved the pain in the tongue, but complained bitterly of that in the neck.

CASE 4.—Dr. Coley asked me to see a case of ulceration with overgrowth involving nearly the whole of the lower half of the pinna. The lower part of the back of the pinna was a sloughing, foul surface with heaped-up edges: above this was a deep pouch discharging pus, the outer wall of which was formed of semi-necrotic skin. There was no enlargement of the lymphatic glands, but the history given was of three years' duration. My first inclination was to remove at least half of the pinna, as it looked so like epithelioma, but in the absence of glandular enlargement — which pointed rather to rodent ulcer — and in view of the marked deformity such an operation would cause I decided to try radium first. Radium was applied for a total period of ten hours during four weeks. Improvement was noticed within a week. Now the ulcer is more healthy-looking, the discharge is small in amount, the pinna generally less swollen, the overgrowth of new tissue much diminished, and the normal surrounding epithelium appears to be covering the diseased area from the margins. One is not yet quite happy about this case; it is, however, half healed, and, considering the previous duration of the disease and the short time it has been under treatment, it seems so far satisfactory.

On one occasion I allowed this patient to hold the radium to the back of the lobule of the ear herself; after an absence of three quarters of an hour I found her holding the radium over a portion of healthy skin behind the lobule, and an ulcer formed here. Four weeks have elapsed since this happened, and the ulcer is far from healed.

CASE 5.—That of a young woman with lupus of the end of the nose, spreading also into the mucous membrane of the nasal passages for a distance of about three quarters of an inch. The radium was applied for a total period of fourteen hours over the various parts of the diseased surface. So far as the skin condition is concerned one would have expected a more satisfactory result in the time from treatment with X rays. The result on the mucous membranes seems to have been

more satisfactory. X rays affect a larger area at a time than a small piece of radium. The result of an hour's application to the worst portion of the skin resulted in a heaping-up crust on this part in the course of a few days. [Since writing the paper this case has much improved]

In conclusion, may I offer a few general remarks and opinions? In doing this it will be understood they are only given as impressions of a new treatment in which one has to feel one's way. Except where stated, the observations are deduced from the cases mentioned and not from those of other workers.

(1) In lupus of the nasal cavities and throat radium appears to offer more hope of cure than any other remedy known at the present time.

(2) The radium-holder I have devised is a useful instrument for the purpose, although the usual form of holder mounted as a signet ring is a more handy form for applications to the skin.

(3) The final effect of the radium is not seen until two or three months have elapsed after any one application.

(4) The usual length of application recommended, viz. ten to twenty minutes, is too short a time for most cases, unless a great many sittings are given. The 500,000 strength paste—the one used in these cases—is the strongest used for medical purposes, and with this a minimum time of half-an-hour seems safe; even with this strength several applications may be required to the same surface.

(5) The curative effect of the radium appears to die down gradually after any one application. In other words, if the dose is insufficient the disease is only kept in abeyance, and will re-assert itself. On the other hand, the effects of an overdose do not show themselves at the time, but not until about two weeks have elapsed.

(6) The signs of an overdose seem harder to detect in a mucous membrane than in the skin, or at least where the mucous membrane is much altered by disease.

(7) X-rays are probably more satisfactory for large areas of skin disease than radium, unless the surgeon is a millionaire of charitable disposition, or unless time is no object to both patient and surgeon.

(8) Radium appears to have the power of rapidly relieving pain in some forms of ulceration.

(9) Sufficient time has not elapsed in any of my cases to say whether treatment by radium results in a permanent cure.

[NOTE.—A surgeon asked me to try the effect of radium in a lady friend of his who had had a small hard prominent growth two lines in diameter just above the ciliary margin of the upper eyelid

for fifteen years. The eyeball was protected by lead-foil through a small hole in which the growth protruded. Three applications of three-quarters of an hour each, with intervals of one week, resulted in the growth entirely disappearing without ulceration or inflammation. This case is interesting, although not coming under "diseases of the nose and throat."]

THE VISUAL FIELDS IN ANTERIOR NASAL SINUSITIS.

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RECENTLY in this Journal¹ I described the visual field anomalies associated with suppuration in the spheno-ethmoid group of accessory sinuses. In this paper those changes observed in twenty-three cases occurring in disease of the fronto-antro-ethmoid group are recorded.²

Observations extending over two years have been made upon forty-four patients suffering from sinusitis, the posterior group (previously published) being affected in 33 per cent., the anterior in 47 per cent., and both groups in 20 per cent. In suspected sinusitis the visual fields were examined wherever possible, and with few exceptions before any nasal treatment was attempted. Investigations were again made at intervals during progress, but not on the same day of any therapeutic measure, nor in females during menstruation. The same size and colour test-objects were always used, excepting when any visual defect was extreme. The peripheral field was tested with 5.0 mm. squares of white, red and green, and central vision by 1.0 mm. squares of red and green. Perimetric records were always made in good diffuse daylight. If, in the presence of contraction of the colour fields alone there was any reason to suspect defective colour-perception, Holmgren's wools were used to elucidate this point. In anterior sinusitis the diagnosis of the nasal condition presents less difficulty than in the posterior group, and as most of the cases were ultimately confirmed by operation, details have only been mentioned where necessary. In this paper the term "concentrically contracted" refers to a field which has the same form or shape as a normal field, only smaller; "generally

¹ JOURN. OF LARYNGOL., RHINOL., AND OROL., May, 1911, p. 242.

² Two cases are also included in which there was posterior sinusitis as well, the anterior group, however, being more extensively affected.

contracted" to a field in which the whole is involved, but a portion more so than the rest.

Cases 1 to 5, 10 to 12, and 17 to 21 inclusive were observed in Dr. Watson-Williams's Clinic at the Bristol Royal Infirmary; 15 and 16 were under Mr. C. H. Walker in the Ophthalmic Department of the Bristol General Hospital; and 6 to 9 inclusive, 13, 14, 22 and 23 under Mr. Russ Wood at the Shrewsbury Eye and Ear Hospital.

ANTRAL SUPPURATIONS.

(1) Ellen C.—, aged fifteen. Chronic bilateral antral sinusitis, with recurrent polypi; duration two years. R.V. and L.V. $\frac{5}{6}$; marked hippus; fundi healthy. *Visual fields* (before and after successful sinus treatment).—Right and left: Normal for white and green. The diagnosis in this and Cases 2 and 3 was confirmed at the subsequent Watson-Williams radical antra operations.

(2) Elsie G.—, aged twenty-one. Chronic bilateral antral sinusitis, with recurrent polypi, and probable sphenoid suppuration. R.V. and L.V. $\frac{5}{6}$; asthenopia; esophoria; slight hippus. *Visual fields* (before treatment).—Right: Concentric contraction for all colours—white, 10°; red and green, 20°. Left: White genera, contraction, 10°, but 40° in temporal field; red and green general contraction, 20° and 30° temporal. There is partial reversal for red and green in both eyes, but she presents no hysterical stigmata. *Visual fields* one week after operation were more contracted. Three months later (in spite of presence of pus in both superior meatus) the white are normal, red and green remain unchanged.

(3) Mrs. A. P.—, aged thirty-nine. Chronic right antral sinusitis, with polypi; many years' duration. R.V. $\frac{5}{6}$; dacryocystitis. L.V.: blind with traumatic retinitis proliferans. *Visual fields*.—Right: White normal; concentric contraction for red 15° and green 20°, very slightly more in temporal fields. *Visual fields* (one month after successful sinus treatment), no improvement; considerable neurosis.

(4) Joseph T.—, aged fifty-eight. Chronic bilateral antral sinusitis, possibly polysinusitis; duration five years. R.V. and L.V. $\frac{5}{6}$; right dacryocystitis. *Visual fields*.—Right and left: Practically concentric contraction: white, 5°–10°; red and green, 25°–35°. Treatment refused by this and Case 5, and patients lost sight of. The diagnosis in this and Case 5 was confirmed by Lichtwitz exploratory puncture.

(5) George S.—, aged twenty-five. Chronic left and probable right antral sinusitis; duration four years. R.V. + 7.5 = $\frac{5}{12}$; L.V. + 3 = $\frac{5}{6}$; insufficiency left inferior oblique. *Visual fields*.—Right and left: White concentric contraction, 5–10°; red and green general contraction, 15°–25°; slightly more marked in the superior temporal quadrants. Partial reversal of red and green in the left but the patient is of phlegmatic type.

(6) Ruth E.—, aged thirty. Chronic right antral sinusitis; duration eight years. R.V. and L.V. $\frac{5}{6}$. *Visual fields* (before operation).—Right: White normal, green general contraction 7°. Left: White and green normal. *Visual fields* (after operation).—Right: In spite of successful treatment, white and green four months later were more contracted. Left normal. There was no neurosis. Diagnosis in this and Case 7 was confirmed at a radical nasal operation.

(7) Ellen R.—, aged twenty-two. Chronic right antral sinusitis; duration four years. R.V. and L.V. $\frac{5}{6}$. *Visual fields*.—Right similar to Case 7. Left normal.

(8) Charles W.—, aged twenty-five. Left recurrent acute antral sinusitis. R.V. and L.V. $\frac{9}{10}$. Eyes normal, no central scotoma. *Visual fields* (during attack).—Right: Normal for white and green. Left: White normal, green concentric contraction 20°. *Visual fields* (after attack).—Right: White and green normal. Left: White and green very slight concentric contraction. *Diagnosis*.—A radical antral operation had been performed seven years previously for chronic sinusitis, and the suppuration cured, but the patient remained liable to acute attacks.

(9) Henry B.—, aged thirty-seven. Acute left antral sinusitis, with necrosis of the hard palate. R.V. and L.V. $\frac{9}{10}$. Fundus normal; no central scotoma. *Visual fields* (before treatment).—Right: White and red normal. Left: White and red contracted 10° in the temporal quadrants, but elsewhere normal. *Visual fields* three months after recovery were full.

FRONTAL SUPPURATIONS.

(10) Harry P.—, aged thirty-two. Bilateral chronic frontal sinusitis; duration eleven years, very severe cephalalgia. R.V. $\frac{6}{12}$, L.V. $\frac{9}{10}$. Asthenopia; moderate hippus; green blind. *Visual fields* (a Killian had been performed a year previously on the right sinus, curing the suppuration).—Right and left: Concentric contraction for white 5°–12° and red 30°. *Visual fields* (one month after operation on left sinus, when considerable suppuration still present).—No change. The diagnosis was confirmed at the operation (Watson-Williams osteoplastic flap) on the affected sinuses in this and Case 11.

(11) Sidney B.—, aged twenty-eight. Chronic bilateral frontal sinusitis with expansion of the anterior wall; duration five years. Intense cephalalgia. The sinuses were enormously extensive, both laterally and antero-posteriorly. R.V. $\frac{9}{10}$, L.V. $\frac{9}{10}$; asthenopia. *Visual fields* (before operation).—Right: White concentric contraction 5°; green general contraction 20°, but temporal 40°. Left: Concentric contraction for white 5° and green 20°. *Visual fields* (one month after operation when suppuration and symptoms ceased). No change.

(12) Mrs. H.—, aged twenty-nine. Chronic bilateral frontal, right antral and possibly right sphenoidal sinusitis; duration four years. R.V. $\frac{9}{10}$, L.V. $\frac{9}{12}$. Bilateral hazy neuritis; hyperphoria. *Visual fields* (two years after successful treatment of right antral sinusitis by a Watson-Williams radical operation). Right: Concentric contraction white 5°–10°, red 15°–20°, and green 30°. Left: General contraction, white 20°–30°, red and green 30°–40°, slightly more superiorly and inferiorly. *Visual fields* (two months after Watson-Williams osteoplastic flap on both frontals).—Right and left: Present the same characters, but all colours 5°–10° more extended. Diagnosis was confirmed at the operations.

(13) Elsie N.—, aged twenty-one. Right subacute traumatic frontal sinusitis. R.V. $\frac{6}{10}$, L.V. $\frac{9}{10}$. Very marked hippus, no central scotoma. *Visual fields*.—Right: White and green general contraction 30°, but temporal 45°. Left: Concentric contraction for white and green 20°. *Visual fields* (after treatment).—Right: Very considerable extension for white and green. Left: Practically full. The marked hysterical element accounts for the contraction in the left, and not a little of the right. *Diagnosis*.—The history of a severe blow over the right brow followed by unconsciousness, and later by constant frontal headache and blood-stained discharge from the right nostril. The right middle turbinal is hypertrophied, and pus in the middle meatus. The antra and left frontal sinuses transilluminate well, but the right frontal defectively. The symptoms subsided after hemi middle turbinectomy.

(14) Sarah D.—, aged sixteen. Left acute frontal sinusitis; enormous

oedema left eyelids and forehead. R.V. and L.V. $\frac{9}{16}$. No proptosis; no central scotoma. *Visual fields* (taken after subsidence of oedema).—Right: Concentric contraction for white and green 20° . Left: White and green general contraction 30° , but temporal 40° , with complete reversal of red and green. *Visual fields* (after treatment).—The left was now as extensive as the right, but concentric contraction of 25° still present. The marked hysteria accounts for the reversal of colours, and not a little of the contraction in both eyes. *Diagnosis*.—Severe frontal pain set in after a "cold." Much oedema and tenderness of left forehead and eyelids. No pus in the nose, but enlargement of the left middle turbinal. Transillumination of left frontal sinus poor. The symptoms subsided in a few days after leeching the forehead and nasal septum, and a hemi middle turbinectomy.

(15) Henry B——, aged sixty-five. Left frontal mucocele; duration twenty years. R.V. $\frac{9}{16}$, L.V. $\frac{9}{16}$. Very marked proptosis forwards, outwards and downwards. Left pupil is 35 mm. from mid-line, and the right 31.5 mm. Fundi normal. *Visual fields* (before and after operation).—White and green normal. Diagnosis was confirmed at the subsequent modified Killian operation.

ANTERIOR ETHMOID.

(16) John T——, aged fifty-four. Right ethmoidal mucocele perforating the lachrymal bone and tracking forward sub-periosteally, presenting a large ovoid swelling at right inner canthus. R.V. and L.V. $\frac{9}{16}$. Eyes healthy. *Visual fields* (before and after operation).—Right and left: White and green normal. Diagnosis confirmed at operation.

POLYSINUSITIS.

(17) Frank S——, aged thirty-four. Chronic left pansinusitis; duration six years. R.V. = $3\frac{9}{16}$, L.V. = $4\frac{9}{16}$. *Visual fields* (taken at intervals three months after operation when the nose was practically free from pus).—Right: White, red, and green concentric contraction $20-30^\circ$, but a little more in the superior temporal field. Left: Extreme general and temporal contraction—white and green being within the 20° circle. Post-operative debility explains some of the contraction observed. Diagnosis was confirmed at the operations. At different dates Watson-Williams operations were performed on the frontal antral and sphenoid sinuses.

(18) Reginald C——, aged fifteen. Chronic bilateral, antral, and sphenoidal sinusitis; duration one year. R.V. and L.V. $\frac{9}{16}$; bilateral hazy neuritis; marked hippus; esophoria. *Visual fields* (before operation).—Right: White, slight general contraction, but $20-25^\circ$ in the superior temporal quadrant; red and green concentric contraction $25-35^\circ$. Left: The fields are similarly affected, but more contracted. *Visual fields* (three days after operation).—Right and left: White are practically normal, and red and green extended $10-15^\circ$. The neuritis has subsided. *Diagnosis*.—Confirmed at operation (Watson-Williams radical antral). After the polypi had been removed and the antra freed from suppuration, pus was repeatedly seen in the superior meatus. The neuritis was dependent on the sphenoidal sinusitis; the relief following the removal of polypi was probably due to a more free escape of pus from the posterior sinuses.

(19) Euphemia H——, aged thirty-three. Chronic bilateral, frontal, and antral sinusitis; duration five years. R.V. $\frac{9}{16}$; L.V. $\frac{9}{16}$. *Visual fields* (one year after operation, the sinuses free of pus).—White contracted in right 30° inferiorly,

and in left 15° superiorly and 25° inferiorly; red and green concentric contraction 25° in both. The diagnosis was confirmed at the operations (Watson-Williams osteo-plastic frontal and radical antral operations) in this and Case 20.

(20) Mary H——, aged twenty. Chronic bilateral, frontal, and antral sinuses; duration six years. R.V. and L.V. $\frac{6}{6}$. Asthenopia; moderate hippus. *Visual fields* (before treatment).—Right and left: White normal, green contracted superiorly 10°-15°, and inferiorly 15°-20°. No opportunity presented for examining the fields after treatment (Watson-Williams osteo-plastic and radical antral operations).

(21) Mrs. S. A——, aged thirty. Acute bilateral, frontal, and antral sinusitis. R.V. and L.V. $\frac{6}{6}$. No central scotoma. *Visual fields* (during attack).—Right and left: Concentric contraction, white 5-10°, red and green 20°. Partial reversal of the two latter. No hysterical stigmata. *Visual fields* on recovery normal. *Diagnosis*.—She was seen on two occasions during an attack, the first of which, being post-influenzal, edema and redness of the forehead and cheeks were present, the middle turbinates were engorged, and there was pus in both middle meatus.

(22) Charles W——, aged sixty-eight. Chronic polysinusitis and subsequent malignant growth in right antrum. R.V. and L.V. $\frac{6}{4}$; optic atrophy; right dacryocystitis. *Visual fields*—Right: White temporal contraction 20°. Left: White general contraction 20°, and temporal 60°. Green is contracted within the 15° circle in both fields. The fields became progressively more affected in this and in Case 23.

(23) John T——, aged seventy-three. Right and left polysinusitis; many years' duration, with subsequent development of inoperable malignant disease in the right antrum. R.V. and L.V. $\frac{6}{6}$. *Visual fields*.—Right and left: Present similar contractions to those in Case 22, though to a less extent.

RÉSUMÉ.

New Antral Suppurations.

No. of cases.	Character of field.	No. of cases.	Effect of treatment on field.
1. Normal.		1. Normal before and after.	
2. White normal; marked concentric contraction for colours.		2. (Acute sinusitis.) Recovery to normal.	} Sinus treatment successful.
3. Concentric contraction for all colours.		1. Considerable extension.	
2. General contraction, more in temporal.		1. No change.	
1. Slight temporal contraction.		2. Slightly more contracted. Treatment in one of these not successful.	
In two of these partial reversal of colours; central scotoma not present.		2. Treatment not permitted.	

Five Frontal Sinusitis.

3. Chronic suppuration. Two cases concentric contraction, one general.	2 (Chronic.) No improvement.	} Sinus treatment successful
2. Acute suppuration. General contraction, slightly more in temporal.	1. (Chronic.) Improvement.	
Central scotoma not present.	2. (Acute.) Rapid improvement.	

Two Mucocoeles.

No. of cases	Character of field	No. of cases.	Effect of treatment on field.
2.	Normal fields.	2.	Normal fields.

Eight Polysinusitis.

2. Concentric contraction.	2. Improved. Sinus treatment successful.
3. General contraction, more in temporal.	2. Only seen after operation. Sinus treatment unsuccessful in one.
3. Altitudinal.	2. Inoperable malignant disease.
In one of the above, partial reversal of colours. Central scotoma not present.	1. Not seen after treatment.

In my former article dealing with the occurrence of field affections in cases of spheno-ethmoid sinusitis, I laid stress upon some change being present in every case. With three exceptions this is true for the fronto-antro-ethmoid group. This finding is in opposition to that of Hinkel, Henrici and Haffner (quoted by Onodi), who reported normal fields in a large number of cases. Berger believes that peripheral field narrowing is most commonly observed, and Birch-Herschfeld lays stress on the presence of central scotoma when the optic nerve is affected in posterior sinusitis. From a perusal of the cases reported and those recorded here, it will be seen that my observations are in agreement with both of these authors.

The ocular symptoms occurring in nasal accessory sinus disease were fully discussed by the Laryngological Section of the British Medical Association at the Birmingham meeting this summer. Professor Onodi, in his very comprehensive paper, stated that field changes did occur, but not always. Dr. Adolph Bronner, in his reply, took exception to my statement that field changes were present in 90 per cent. of these cases, casting doubt on the correctness of my observations. He pointed out the necessity in making perimetric examinations, of using the same size test objects, of repeated observations, and the effects upon the fields of variations in illumination, the importance of excluding other causes, and the fact that disease was so frequently found present *post mortem*, when no trouble had been complained of in life. In making these observations I approached this subject from the ophthalmological point of view, and it will be seen from this and the previous paper that all the precautions suggested by Dr. Bronner, and more, were taken in the perimetric examinations. The exclusion of other aetiological factors is always a difficult

matter; where such possibilities have been present they have been mentioned, but it has been obviously impossible for want of space to go into details of differential diagnosis in each case. A point that needs special emphasis is that a patient cannot be aware of a field defect unless it is a large central scotoma or a hemianopsia; but if the fields are examined in all cases of sinusitis, the above results will readily be found.

Two facts stand out clearly in this series of cases in the anterior group—peripheral contraction practically always occurs, and central scotoma not at all. These defects appear to present the same characters in antral and frontal sinusitis. The field limitations of the two eyes in bilateral sinusitis do not always correspond in form. White, red, and green are usually contracted, the colours generally more, and in particular the green. Sometimes the field defects in one eye do not present the same characters, *e.g.* white altitudinal and green concentric in Case 19. The most commonly observed contraction in anterior sinusitis is concentric, but general contraction almost as frequently. In the latter, some portion of the field is more markedly affected, usually the temporal, but altitudinally not rarely. Temporal contraction in marked degree occurred in three cases, in which the anterior group was alone affected; however, as a rule it was but slight. In polysinusitis it is more marked when the sphenoid is one of the affected sinuses, thus bearing out my former contention that marked temporal contraction is a characteristic of the posterior group. Altitudinal limitation of the fields occurred in three cases of polysinusitis, in all of which the sphenoidal was affected, but not in antral or frontal sinusitis. Probably this form of contraction does occur more usually in the posterior group, and that my earlier hypothesis was incorrect.

The contraction occurring in the anterior group seems to be as marked as that in the posterior, excepting when acute ocular symptoms supervene. The degree of contraction is not necessarily any criterion of the severity of the sinusitis as gauged by the nasal symptoms—not infrequently a sinusitis causing no subjective symptoms is associated with marked defect. Reversal of the colour fields is generally held to be indicative of hysteria, but of the three patients showing this condition, two were very phlegmatic individuals. Normal fields were found in mucocoeles and one antral sinusitis; the latter I shall refer to later. Central and ring scotoma have not been seen in this group.

ÆTIOLOGY OF FIELD AFFECTIONS.

The fact that field anomalies are present in 90 per cent. of sinusitis cases and normal fields in non-sinus affections of the nose (*vide* former article) is very suggestive that the sinus suppuration is the causal agent. This is also supported by the improvement which not infrequently takes place after successful sinus treatment, and the occurrence of unilateral defects on the same side as the sinusitis. Numerous reflex symptoms result from nasal irritation, and apparently this might be considered to be one of them; but this was discussed fully in my former paper. Pressure alone, particularly in the posterior group, has been suggested as the cause, but chronic suppurations are as a rule not "closed" sinuses, and therefore this is mechanically impossible. In one of the mucocoeles very considerable proptosis occurred, but the fields were normal. Finally, papillœdema from pressure does not necessarily give rise to central scotoma (*vide* Case 2, article referred to), and therefore I think the chief cause is a local toxæmia.

The toxins in *chronic* cases would appear to permeate slowly through the thin sinus wall because the mucosa is usually atrophied, and offers less resistance to the passage of these substances. This hypothesis is supported by the presence of temporal contraction in the posterior group and a more general contraction in the anterior. In posterior sinusitis the nasal side of the optic nerve is in direct contact with the sinus wall, and consequently this part of the nerve is most affected, temporal contraction resulting. In the anterior group the toxin becomes diffused through the orbital tissues before reaching the nerve, which is not in contact with the sinus wall, hence the whole circumferential fibres are equally affected and general contraction follows. The mucosa in *acute* suppuration not being atrophied larger quantities are presumably carried by the vessels. Edema of the nerve-sheath results when the posterior sinuses are involved, and central scotoma, peripheral contraction, and optic neuritis may follow from the pressure. But in the anterior group this cannot take place because of the loose orbital fat, so that peripheral contraction is alone seen. Optic neuritis and central scotoma are not observed unless there is some specially favourable factor (optic neuritis did occur in one polysinusitis, but the sphenoidal sinus was also affected). Central scotoma does not occur in chronic anterior sinusitis, because the macular bundle of the nerve is still almost central in position, and is protected by the circumferential fibres. In one chronic antral

sinusitis, a young girl, the fields were normal. This was, I believe, because the antrum, being not fully excavated, had thick bony walls through which the toxins permeated less readily. Hysteria no doubt in some cases adds to the field contractions, but toxic substances are the chief cause.

TREATMENT AND PROGNOSIS.

In chronic suppurations efficient treatment of the sinus does not always improve the ocular symptoms, the nerve having been probably permanently damaged. Few cases, however, go on to optic atrophy, because the local toxæmia is mild in character. In acute suppurations rapid improvement takes place under treatment.

CONCLUSIONS.

Peripheral field contraction occurs in fully 90 per cent. of all sinus cases, and is usually caused by the action of toxins upon the nerve; the more common is concentric contraction. Central and ring scotoma do not ordinarily result in anterior sinusitis.

Treatment is most beneficial in acute suppurations. The perimeter should always be used in suspected sinusitis. Normal fields help to negative, and contracted fields to confirm the diagnosis. White and green are the best test-objects.

I wish to acknowledge my best thanks to Dr. Watson Williams, Mr. C. H. Walker, and Mr. Russ Wood, for permission to publish these cases.

REFERENCES.

- ONODI.—“Optic Nerve and Accessory Sinuses.” Translated by Lückhoff, 1910.
WALLIS, G. F. C.—JOURN. OF LARYNGOL., RHINOL., AND OTOL., May, 1911.

NINTH INTERNATIONAL OTOLOGICAL CONGRESS

THE Ninth International Otolological Congress will be held at Boston, Mass., U.S.A., from August 12 to 17, 1912, in the new buildings of the Medical Department of Harvard University. Dr. John Clarence Blake, Professor of Otology in Harvard University, has been appointed President of the Committee of Organisation.

Intending members who desire to take part in discussions, in the reading of papers, in the loan of instruments or specimens, etc., are requested to send the title of their contribution, together with an abstract of the same, to the General Secretary, Henry O. Reik, 506, Cathedral Street, Baltimore, Maryland, U.S.A., as soon as possible.

LATERAL SINUS THROMBOSIS FOLLOWED BY PYÆMIC ABSCESS IN THE PROSTATE; OPERATION; RECOVERY.

By J. GAY FRENCH, M.S.LOND., F.R.C.S.,

Surgeon in Charge Ear, Nose, and Throat Department, Great Northern Central Hospital; Assistant Surgeon, Ear, Nose, and Throat Department, Royal Free Hospital; Assistant Surgeon, Central London Throat and Ear Hospital, Gray's Inn Road.

THE patient, a boy, aged fourteen, was sent up from an infirmary, and was admitted for urgent operation into the Great Northern Central Hospital on the night of April 8, 1911. His previous history was supplied by the medical officer of the infirmary.

Early in February, 1911, the boy contracted measles, which was followed by a left-sided otorrhœa. No notice had been taken of this, and he had never had any treatment for it. Towards the end of March he began to get headache and pain in the ear; these steadily got worse. On the evening of March 31 he had a rigor and vomited twice, and on the following morning the boy looked so seriously ill that he was sent to the infirmary, where he was admitted. On admittance his temperature was 101° F., pulse 96. No discharge could be seen coming from the ear, there was no swelling over the mastoid, but distinct tenderness on pressure over the mastoid and occipital areas was complained of, and he was noticed to have a definite spontaneous nystagmus to the right. He was ordered a salicylate of soda mixture, and was put to bed to be kept under observation. At 8 p.m. on the same night his temperature was 103.4° , pulse 120. During the next four days his condition remained much about the same; he had three attacks of vomiting, no rigors; the temperature showed a morning fall with an evening rise, varying from 100° – 103.8° , pulse 96–112. Bowels open daily, but slightly constipated. At 3 p.m. on Friday, April 7, his temperature shot up to 106° , and he was ordered tepid sponging and given 5 gr. of phenacetin. His pulse at this time was 120, respirations 28. At 11.30 p.m. his temperature had dropped to 99.6° , but then continued to steadily rise till 2 a.m., April 8, when it stood at 105.4° . He again had sponging, and at 10 a.m. it had dropped to 98° , pulse 72, respirations 20. Throughout the day the temperature again steadily rose, till at 6.30 p.m. it was 106° F. He was now in a delirious condition. Quinine sulph., grs. v, was given, but as his condition continued to get worse it was decided to remove him to the Great Northern Central Hospital for immediate operation.

I first saw him at 11 p.m. on April 8; his condition then

was very serious. Temperature 103° , pulse 112, respirations 28. Face flushed, eyes very bright, delirious. There was no edema over the mastoid, nor any discharge visible in the external auditory meatus. Extreme tenderness was, however, present over the mastoid region and over the occipital area on the left side. Knee-jerks and plantar reflexes absent. Optic discs could not be examined. It was obvious that the boy's only chance was an immediate operation.

Under chloroform the usual incision for the radical mastoid operation was made and the mastoid antrum opened. It was full of foul-smelling pent-up pus; this was cleared out, and the bone was gouged away, posteriorly exposing the sigmoid groove. Pus was found between the sinus and the bone, and the sinus itself thrombosed. The bone was removed for a further two inches posteriorly, thoroughly exposing the lateral sinus. The internal jugular was next exposed in the neck, and was found to be thrombosed down to about an inch above the level of the upper border of the cricoid cartilage. The vein was tied at the level of the upper border of this cartilage, divided, and about an inch and a half excised, the lower extremity of the upper part of the vein being brought out into the neck and fixed there. The cervical wound was closed, a drainage-tube being placed at its lowest part. The lateral sinus was incised and breaking-down blood-clot turned out until free bleeding took place. This was arrested by plugging between the bone and the sinus wall. An attempt to irrigate through from the open internal jugular in the neck failed, and could not be persisted in as the patient's condition now became critical, it being thought that he would die on the table. The post-aural wound was left open and plugged with moist cyanide gauze and dressings applied. The patient was an ashen-grey colour, the respirations very shallow and rapid, and the pulse at the wrist imperceptible. He was given hypodermically 1 c.c. pituitary extract, the left median basilic vein was opened and a pint of normal saline at 100° F. with a drachm of adrenalin chloride, 1 in 1000, injected.

During the remainder of the night the patient's condition seemed almost hopeless. The radial pulse was hardly perceptible, the skin cold and clammy, and he was very restless. He was given digitalin and strychnine at varying intervals. He could not retain any rectal salines. At 10 a.m. the pulse became rather better in volume, and varied throughout the day from 120 to 130. Temperature 99.2° to 100.2° . Bowels were not opened, but the patient passed some

bright blood and mucus *per rectum*. He was given 19 oz. normal saline as a subcutaneous infusion which was very slowly absorbed. Retained food well.

April 10.—Much better. Temperature 99.2° to 101° F. Pulse 124 to 112. Enema with good result, passed a little blood *per rectum*. Report *re* organisms from lateral sinus clot shows pure *Staphylococcus aureus*.

April 11.—General condition very much better. Wound dressed—looks quite healthy; tube removed from neck. Temperature at 6 p.m. shot up to 102° . Pulse 100.

April 12.—Wound behind ear looking very septic to-day. Temperature 98.4° to 100.2° . Boracic fomentations applied four hourly to wound.

April 13.—Passed blood and mucus *per rectum* again to-day. At 10 p.m. temperature 103.2° .

From the 13th to the 19th there seemed to be a distinct improvement in his condition; food was taken well and retained, and no more blood was passed *per rectum*. The temperature, however, had a regular morning fall to between 98° and 99° , and an evening rise from 102° to 103° .

April 19.—Patient not so well to-day. Drowsy and disinclined to take food. Some nausea towards evening, but no vomiting. Was seen by Dr. Price. Lungs, heart and abdomen normal. No knee-jerks, Kernig's sign present. Lumbar puncture performed; fluid came out under fairly high pressure. Dr. Shaw reported that there were a few leucocytes present, no micro-organisms, but that the albumen-content was increased.

April 20.—Vomited twice to-day. Temperature 6 a.m. 97.8° , at 10 a.m. 103.2° .

April 21.—Vomited once. Frontal headache. Temperature intermitting as before, pulse 80 to 100. Given 80 millions *Staphylococcus aureus* vaccine.

Condition remained about the same till the 28th, when he passed some pus *per rectum*. On the 29th there was more pus *per rectum*. Examination of this showed *Staphylococcus aureus* and *Bacillus coli communis*. Rectal examination was made by Mr. Choyce, who reported that the prostate was enlarged, inflamed and tender, with a ragged surface in one portion, and that the boy had evacuated a prostatic abscess.

May 8.—Up to this date the patient did very well; but from the 8th to the 13th his evening temperature rose to 103° . On the 14th there was no rise, and from that date onward the boy did

extremely well, making an uninterrupted recovery. The wound behind the ear had now completely closed, and on June 20 he was sent to the convalescent home.

I think this case is well worth publishing, as I have never come across any record of a pyæmic abscess developing in the prostate gland secondary to a lateral sinus thrombosis, in this case the more extraordinary that it should have occurred in a boy of fourteen! Another point of interest is the length of time that intervened between the date on which he developed definite signs of intra-cranial complications and the date of operation. That he should have recovered at all after the apparently hopeless condition in which he was is in itself, I think, sufficient to justify my recording the case.

In conclusion, I must express my thanks to my house-surgeon, Mr. Cooper, for his very extensive and able notes. That the patient is alive to-day is undoubtedly due to his indefatigable and assiduous care.

SOCIETIES' PROCEEDINGS.

PROCEEDINGS OF THE ROYAL SOCIETY OF MEDICINE—LARYNGOLOGICAL SECTION.

Extra-Metropolitan Meeting held at Bristol, June 2, 1911.

DR. P. WATSON-WILLIAMS, *President, in the Chair.*

MEMORIAL TO SIR FELIX SEMON, K.C.V.O., M.D.

The PRESIDENT, on behalf of the Organising Committee, presented a bound and engrossed address to Sir Felix Semon, containing a complete list of the subscribers to the fund for establishing a perpetual memorial of his work in laryngology. The wording of the address was as follows:

"DEAR SIR FELIX SEMON,—When it was understood that you intended to retire from the active exercise of your profession, we felt desire to show our appreciation of your life's work and of your devotion to the cause of humanity.

"Many of your *confrères*, more especially those engaged in your branch of medicine, knowing the extent to which laryngology is indebted to you, were anxious to express their recognition of the example you have set of a high professional standard, of the educational assistance you have afforded to younger men in your branch, and of the great efforts you have made and the personal influence you have exerted to promote in every direction the advancement of that speciality to which you have so successfully devoted your energies.

"Numerous friends have been glad to take advantage of this opportunity of testifying to your gratitude for the services you have rendered to them personally, and at the same time to express their feelings of esteem and affection for you as a man.

"It was recognised that the most appropriate manner of commemorating your work would be some permanent memorial by which your name would be handed down to posterity. For this purpose we—whose names are inscribed below—have raised a fund with which we intend to establish a Scholarship or Lectureship in Laryngology bearing your name. We feel certain that this scheme for furthering scientific work in your branch will be to you the most acceptable form which a testimonial could take.

"We trust that, in spite of your retirement from practice, your influence in furthering medical science and study will long continue to be felt, and that you will yourself witness valuable results promoted by the memorial we are establishing in your name.

"At the same time we desire to express our esteem, regard, and affection for Lady Semon, and hope that this recognition of your great work will remain for her a happy memory throughout her whole life."

As a finishing step of this exceptional memorial of a man's life work, the book further contained the following statement:

"The members of the Organising Committee have the gratification of recording that the wishes of the aforesaid founders have now been fulfilled by the endowment in the University of London of the Semon Lectureship in Laryngology.

(Signed) HENRY T. BUTLIN, President of the Royal College of Surgeons
DUNDAS GRANT, Past President of Laryngological Section, Royal Society of Medicine;

A. MOND (NOW SIR ALFRED MOND, M.P.) } *Hon. Treasurers;*
STCLAIR THOMSON, President-elect }

P. WATSON-WILLIAMS, President of the Laryngological Section,
Royal Society of Medicine, *Hon. Secretary;*

H. J. DAVIS, *Hon. Secretary."*

The PRESIDENT, in handing the gift to Sir Felix, said circumstances into which he need not enter had delayed the presentation of the address until that day. In a sense he was pleased that that was so, because to him had fallen the delight of performing that little ceremony as one of the last acts of his Presidency. It was also very fitting that the presentation should take place in Bristol University, since the rules attaching to the Semon Lectureship were founded upon the ideas of the Long Fox Lectureship. He (the President) congratulated Sir Felix upon the establishment of the Lectureship bearing his name.

SIR FELIX SEMON thanked the President for the kind and graceful way in which he had handed him the gift, which it was a pleasure to him to receive because of the esteem and affection it expressed towards him. The speaker referred to the terms under which lecturers would be appointed, and said his mind had been exercised as to whether the fund should be devoted to some sort of scholarship for an educational purpose in relation to the study of affections of the throat, or whether it should be applied to the encouragement of original research by those of mature years who had had fuller experience; and he felt that there was greater need for the latter. That was why he had instituted the lectureship, and why he stipulated that the lecturer should be appointed from among those who had done most for the advancement of knowledge in that special department, either by clinical or research work.

DEMONSTRATIONS.

DIRECT BRONCHOSCOPY ON A PATIENT.

BY DR. WATSON-WILLIAMS AND MR. A. J. M. WRIGHT.

ŒSOPHAGOSCOPY OF MALIGNANT GROWTH AND APPLICATION OF RADIUM.

BY DR. FINZI AND MR. C. W. M. HOPE.

Mr. Hope passed a split œsophagoscope tube of Dr. Hill's pattern down to the growth. The radium on the end of a long flexible silver rod was then passed down to the growth and slipped through the slit in the œsophagoscope tube which was then easily withdrawn. The whole manipulation only took a few minutes, and the actual introduction of the radium only a few seconds.

THE HILL HERSCHELL METHOD OF ŒSOPHAGO-GASTROSCOPY ON THE LIVING SUBJECT, WITH REMARKS ON PATHOLOGICAL CONDITIONS OBSERVABLE BY THIS MEANS.

BY DR. WILLIAM HILL AND DR. G. HERSCHELL.

The method was described at the February meeting of the Section (see JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY, March, 1911, p. 134).

The PRESIDENT congratulated Dr. Hill on the relative ease with which a view of the stomach was obtained.

Dr. PATERSON said he would like to associate himself with the President's congratulations. He remembered the demonstrations of Mikulicz showing the interior of the stomach, but he thought the present method had advanced the process very materially since the demonstration.

SERIES OF FOREIGN BODIES REMOVED BY DIRECT BRONCHOSCOPY AND ŒSOPHAGOSCOPY, AND SKIAGRAMS RELATING TO ABOVE.

BY MR. HERBERT TILLEY.

A description of these appears in the *Proceedings* (No. 8) Clinical Section, p. 152.

CASE OF MALIGNANT STRICTURE OF THE ŒSOPHAGUS.¹

BY P. WATSON-WILLIAMS, M.D., CHARLES HOPE, F.R.C.S., AND N. S. FINZI, M.B.

A. P—, male, aged sixty-four, had noticed increasing difficulty in swallowing for three or four months, but could not even swallow fluids when first seen by Dr. Watson-Williams on January 10, when œsophagoscopy revealed an infiltrating growth 10½ in. from the upper incisor teeth. Dr. Wm. Hill, in conjunction with Dr. Finzi, applied radium (150 mg. of radium salt) by means of two tubes inserted "tandem," for fourteen hours on February 4, and this so far relieved the obstruction that the patient was able to swallow meat, potatoes, and any solid food. Since

¹ Shown at the February meeting (JOURN. OF LARYNGOL., RHINOL., AND OTOL., March, 1911, p. 143).

then two more applications have been made by Dr. Finzi, the last time only for eight hours, as the patient drew out the radium tube too soon. The growth is easily seen by œsophagoscopy but the patient has been enabled to take food regularly and has greatly improved in general condition, as he was being starved before. [Section of a portion of the epitheliomatous growth shown under the microscope, and Dr. Finzi demonstrated the stricture and the method of application of radium.]

FURTHER NOTES ON A CASE OF EPITHELIOMA LARYNGIS.¹

By P. WATSON-WILLIAMS, M.D.

MISS. L. T.—, female, aged forty-one. An extensive malignant growth, occupying not only the posterior two thirds of the vocal cords, but also extending upwards and over the upper margin of the left thyroid ala so as to appear in the pyriform fossa. She was operated on on November 9, the growth being completely removed. She recovered and was shown subsequently at the meeting in London on March 3, 1911. At that time there was a suspicious-looking granulation in the centre of the cicatrix, and this, on removal for histological examination, was reported by Professor Walker Hall to be a recurrence in an early stage. The larynx was therefore again opened, and the cicatrix freely removed, as the only alternative to a total laryngectomy. The patient has done well, and as the tissues removed at the operation were devoid of any indication of malignancy, there is reason to believe that the growth was successfully extirpated. But the size and extent of the growth at the first operation necessitated unusually free removal of the left half of the larynx, including the arytenoid and aryteno-epiglottidean fold and left margin of the epiglottis, and as a result the cicatrix is contracting so as seriously to interfere with respiration. A large intubation tube has been inserted with only temporary relief to the stenosis, and it was not well tolerated, and it is feared that a tracheotomy tube will have to be worn permanently.

PATIENTS ILLUSTRATING RESULTS OF DR. WATSON-WILLIAMS'S OSTEO-PLASTIC RADICAL FRONTAL SINUS OPERATIONS, ETC.

By P. WATSON-WILLIAMS, M.D.

CASE 1. *Radical Operation for Frontal Sinus Suppuration*—Mrs. O.—. Severe headaches and pain round the left eye dating from a sharp attack of influenza in 1905, from which time a copious purulent secretion persisted. The symptoms were becoming aggravated in 1906 when she first came under the exhibitor's notice. Diagnosis: Left frontal sinus and antral and bilateral sphenoidal sinus suppuration, with left nasal stenosis from septal deflection. A left radical antral operation, with removal of several polypi, and free removal of the anterior walls of the sphenoidal sinuses, afforded marked relief; subsequently lavage of left frontal sinus. In 1908 radical operation was performed on the frontal sinus by Watson-Williams's osteo-plastic method: a very large left sinus was found containing pus and polypi; it extended outwards almost to the external orbital angle, and upwards of $1\frac{1}{4}$ in. above the supra-orbital

¹ Previously shown at the Section's meetings, November, 1910, and March, 1911 (Journ. of Laryngol., Rhinol., and Otol.).

margin, and was 2 in. in depth. The orbital roof and nasal wall were removed. The conformation of the vertical plate of the middle turbinal made the approach to the ethmoidal cells peculiarly narrow and difficult, but the free exposure of the osteo-plastic method of splitting the nose rendered it easier to reach the deeper parts than any other method of exposure could have done. The sinus cavity was drained for forty-eight hours by a rubber tube, and the wound irrigated through the brow for several days. Healing complete, with entire cessation of all headache and discharge, and with no cosmetic defect other than some slight depression above the brow inevitable with the obliteration of an enormous sinus.

CASE 2.—Miss S——, aged forty-seven. In 1907 came with symptoms of nasal discharge of ten years' duration, with severe frontal and occipital headaches, inability to do mental work properly, and with increasingly poor health. In 1908 a double radical Killian frontal sinus operation performed. In 1909 both sphenoidal sinuses freely opened and found to contain pus and polypoid granulations. The sphenoidal sinuses were also found to be partially subdivided by a horizontal septum into an upper and lower portion. In 1911 some recurrent suppuration led to the opening of the frontal sinus area, but the sinuses were found to be obliterated, the suppuration coming from some anterior ethmoidal cells.

CASE 3.—W. B——, aged twenty-one. In 1908 both frontal sinuses suppurating; severe headaches. Lavage of both sinuses daily for some weeks. Finally the exhibitor's double osteoplastic radical operation performed, with free removal of the anterior ethmoidal cells and the sphenoidal sinuses opened freely. Cured; he uses two or three handkerchiefs a week instead of two or three a day.

CASE 4.—S. B——, Suffering from severe frontal headaches and nasal discharge for many years; had previously had an external operation on the frontal sinus by another operator, but it had left an external discharging fistula. February, 1910, the osteoplastic operation performed. Mr. Waggett and Dr. Cathcart present. The sinuses communicated and were enormous, measuring 12 cm. laterally, and reaching $7\frac{1}{2}$ cm. above the supra-orbital margin. He was able to get up in the ward four days after operation. He is now free from headaches, and says he feels cured.

CASE 5.—Miss C——, aged thirty-six. For two years left-sided nasal discharge and severe frontal headaches. Diagnosis: Left pansinusitis. Left osteoplastic frontal sinus operation, opening up and removal of ethmoidal cells, and radical antral operation. This was followed by angina Ludovici and cellulitis of the supra-orbital tissues, the supra-orbital wound being kept open and irrigated. She completely recovered, but in 1910 the other frontal sinus suppurated, and was operated on. Is very much improved, but occasionally gets headaches.

CASE 6.—F. S——, aged thirty-four. In 1908 severe headaches and nasal discharge; two previous attacks. The osteoplastic operation performed on the left frontal sinus, the left antrum and both sphenoidal sinuses also opened freely. Now never notices any nasal discharge, and he feels well. There is a slight depression on one side of the nose, owing to a chisel being used instead of a saw in splitting the nose, a small splinter of the nasal bone coming away. Cured.

CASE 7.—Miss H——, aged thirty-four. First seen in March, 1908, with history of headaches and nasal discharge for "years." Double radical antral operation performed by the canine route, and in June, 1908, the osteoplastic frontal operation on the right side. In May, 1909, both sphenoidal sinuses were opened up. There was now no nasal discharge,

but the headaches are unrelieved, but apparently are not due to the nasal condition.

CASE 8.—Miss G——, aged seventeen. Came in April, 1910, with a history of ten years' nasal discharge and severe headaches. In May, 1910, double radical antral operation performed by the canine route, and in July of the same year the exhibitor's osteoplastic operation was performed on the left side. In February last acute symptoms developed on the right side, and a radical Killian operation was performed. Two months later swelling recurred on the right side, and the "bridge," which was found to have been necrosed, was removed. The symptoms are now relieved. It is difficult to see that any external operation has been performed on the left side; there is no obvious scar or depression.

Mr. HERBERT TILLEY said he often wished he could see the Watson-Williams operation performed and follow the details. In comparing the cosmetic results of the operation with others, he thought the result did not depend so much on the operation as on the depth of the sinus, and this could be previously determined by skiagraphy. He remembered a case where the sinus required eleven feet of cyanised gauze one inch in width, and which he considered the largest sinus he had ever seen. He considered that in Killian's operation the operator got an excellent view of the sinus, and he did not think an operator could wish for a better one. If the operation was a more complicated one without giving a better view it was a serious disadvantage.

Dr. CATHCART said, with regard to the merits of Dr. Watson-Williams's operation and Killian's, he had seen both performed—in Killian's own clinic and also by Dr. Watson-Williams in Bristol. The osteo-plastic operation of the latter was not so complicated in practice as it seemed on paper, and it gave a far better view of the sinus than any other he knew of. Every part was exposed, and the operator was able to chip away without any fear of approaching any of the dangerous parts. He considered the cosmetic results in a large number of cases far better than was obtained with other operations, although it took a little longer to perform. The case that he had seen Dr. Watson-Williams operate on, and which was shown at the meeting to have no deforming scar, had the largest frontal sinuses he had ever seen.

The PRESIDENT said that he did not claim in all cases better results by his operation. With a large deep sinus any operation which aimed at obliteration of the sinus was liable to cause some depression above the brow. For his operation he claimed that it gave the operator a more direct approach to the sinus and a better view of the parts, and there was no risk of a narrow bridge becoming absorbed as in Killian's operation. He was very glad to hear Dr. Cathcart's appreciation of the operation that he had witnessed. His (Watson-Williams's) method took a little longer in exposing the sinus and fronto-nasal passage, but the latter part of the operation was then done more quickly and with greater ease than when one had to work under a bridge as in Killian's operation. However, he had himself obtained excellent results with Killian's method, and had shown some patients at the meeting on whom he had done this operation.

PEMPHIGUS OF PHARYNX AND CONJUNCTIVA.

By P. WATSON-WILLIAMS, M.D.

R. D——, aged fifty-eight. His eyes have been inflamed for six weeks, and his throat and mouth sore for about one month. There are

white membranous patches scattered over the palate, pharynx, and inner sides of the cheeks and under-surface of the tongue. The surrounding mucous membrane is swollen and intensely red. When first seen there was a membranous condition of the conjunctiva, but this has partially cleared up with applications of 10 per cent. argyrol. Two days ago the patient attended with bullae on the chest, this being the first evidence of skin involvement.

Bacteriological Reports by Professor Walker Hall.—May 23, 1911: Swab from conjunctiva gave a growth of diphtheroid bacilli of a suspicious type. May 29, 1911: Eye—Gram-positive diplococci and staphylococci only. Throat—Gram-positive strepto-bacilli and cocci only.

The patient is now taking arsenic.

CHRONIC GLOSSITIS. ? CAUSE.

By P. WATSON-WILLIAMS, M.D.

Miss C—, aged sixteen. Tongue has been sore and fissured for five or six years, but much more so during the last year. Some pain on swallowing, and occasional hoarseness. There is a history of discharge from the left side of the nose, but no evidence of accessory sinus suppuration. The tongue is extremely fissured, with atrophy of papillae in some parts and hypertrophy in others. No actual ulceration. No history or evidence of syphilis.

TERTIARY SPECIFIC ULCER OF PHARYNX.

By P. WATSON-WILLIAMS, M.D.

G. M—, aged ten. History of syphilis in both parents, and of a rash and "snuffles" in infant shortly after birth. Treated for keratitis one year ago. Now has general glandular enlargement with a painless deep sloughing ulcer on the right lateral pharyngeal wall.

CYSTIC MIDDLE TURBINAL (RIGHT).

By P. WATSON-WILLIAMS, M.D.

Miss S—, aged thirty-nine. Formerly suffered from "colds in the head," and has had nasal obstruction for many months. There is a large air-containing bone cyst in the anterior half of the right middle turbinal.

RESULTS OF ORBITAL CELLULITIS FOLLOWING ETHMOIDAL OPERATION.

By A. J. M. WRIGHT, F.R.C.S.

Miss S—, aged thirty-three. First attended in 1906 with history of headaches and nasal discharge for ten years. In 1906 left antrum and sphenoidal sinus were operated on. In January last the ethmoidal cells were opened on both sides. An orbital hæmatoma resulted on the left side, suppurated, and was opened. There is now some ptosis and entropion of the lower lid, owing to contraction of the scar and injury to the elevator of the upper lid, but the condition is improving under massage.

PARALYSIS OF RIGHT THIRD NERVE FOLLOWING ETHMOIDAL OPERATION.

By A. J. M. WRIGHT, F.R.C.S.

R. W.—, aged thirty-six. First seen in April, 1911, with history of nasal polypi for about eight years. Following an intra-nasal ethmoidal operation on the right side he developed an orbital hæmatoma and complete right third nerve paralysis. The pupil is now, six weeks after the operation, smaller and reacting, and the ptosis is less, but the condition is otherwise unaltered. Vision of the right eye is unaffected.

(EDEMA OF CONJUNCTIVA FROM ACUTE FRONTAL SINUSITIS.

By A. J. M. WRIGHT, F.R.C.S.

A. W.—. First seen on May 23 last with severe left frontal headache, and œdema of inner portion of left conjunctiva, lids and orbit, and with a conjunctival hæmorrhage. There was a history of a similar attack fifteen years ago. There is pain on extreme deviation of the eyes to the left, with slight diplopia. The septum was deviated to the left, blocking that side. No nasal discharge. The septum was resected on May 26, with relief of the headache, and the swelling is subsiding. There has been a little left nasal discharge since the septal operation.

TUMOUR OF THE CHEEK.

By C. F. WALTERS, F.R.C.S., AND N. S. FINZI, M.B.

Mrs. X—, age forty-seven. Swelling inside cheek from the age of seven, which was of a soft, pendunculated character and painless. This became painful in May, 1910, and got larger a month or two afterwards. The growth continued to increase, and was removed, with the adjoining mucous membrane, in November, 1910. All seemed satisfactory until December 19, 1910, when there was a sudden rapid swelling in the cheek. This increased in size, and was incised a few days later, but continued to grow rapidly.

On January 3, 1911, there was an enormous swelling in the cheek about the size of a Jaffa orange, slightly movable, but with considerable œdema round it. No definite glands felt, but the œdema might have obscured any there were. The anterior part of the swelling fluctuates and appears on the point of breaking externally.

Treatment: January 5, 1911. —Radium, 105 mgrm., used through a filter of $1\frac{1}{2}$ mm. of platinum or lead in two tubes inside tumour sixty-nine hours, also outside skin for twelve hours in each of two places.

February 2. —The tumour had very much shrunk, but there was a pre-auricular gland to be felt. This was excised, and the radium inserted into the wound, 100 mgrm., nine hours, February 23 and May 11. Subsequent treatments, externally and internally, with 205 mgrm.

Histologically the tumour was a mixed one, probably of the nature of an endothelioma or a glandular carcinoma.

THE RELATIONSHIP OF DISEASES OF THE NOSE AND ACCESSORY
SINUSES TO AFFECTIONS OF THE EYE AND THE ORBIT.

An Address Introductory to a Discussion on the Subject.

BY STCLAIR THOMSON, M.D.

I deeply appreciate the honour conferred upon me by the Council of the Section of Laryngology in inviting me to open this discussion. I will try to acknowledge the obligation by being both practical and brief. But I would crave some indulgence, for two reasons: If I speak much of the anatomy and pathology of the nose to a meeting of laryngologists, I may be classed with those who attempt to instruct their grandmothers how to extract the nourishment from the egg of the barn-door fowl; and if, in a gathering where one sees many distinguished practitioners and ophthalmologists, I venture to say much of diseases of the eye, I will most certainly display an ignorance which may make the faithful grieve, and cause the finger of scorn to be pointed at the specialist who views diseases only through a nasal speculum. However, I will try to avoid these pitfalls by adhering closely to our text; by remembering my own conviction that the opener of a debate should be simply the pioneer who pegs out the ground, and not the miner who works it; and by recalling the repeated but friendly advice of our President, "Don't exceed fifteen minutes."

When we glance at the illustration, which will shortly be thrown on the screen, you may all think, with Horatio, that it needs no ghost come from the grave to teach us that diseases of the eye and orbit must be affected by their proximity to the nose and the accessory cavities. A perfervid orator once exclaimed that England was an island almost entirely surrounded by water! He may have inserted the word "almost" to avoid referring to Scotland, the predominant partner who sits at, if not on, the head of England. Well, the enthusiastic rhinologist may say more truly that the orbit and its contents are almost entirely surrounded by the air-spaces of the nose, and must necessarily be as much influenced by the currents of the latter as England is by its sea-board.

Yet many of our recent text-books of ophthalmology are strangely silent on this relationship. They still talk of orbital cellulitis as a pathological entity, coming on "spontaneously"—whatever that means—and of its being followed by periostitis, abscesses, caries, and necrosis. Now the experience of the rhinologist is, that it is not the cellulitis which results in periostitis, abscess, and so forth, but that in the large majority of cases it is a septic process in these neighbouring nasal cavities which is the primary lesion, frequently leading to suppuration, necrosis, and orbital cellulitis.

Chronic periostitis is still in many text-books on eye diseases attributed to syphilis, rheumatism, or scrofula, instead of the much more frequent cause of nasal suppuration. As for the thrombosis of the cavernous sinus, with its characteristic orbital manifestations, we still read in ophthalmic text-books that it is generally due to some injury or traceable to some remote lesion in the lips, neck, teeth, or throat. These certainly may occur, but my own researches indicate that suppuration in the nose and its annexes, or in the ear and mastoid, is a much more constant source of infection. That the orbit may be invaded by distension (from any cause) in the neighbouring accessory cavities is much more generally recognised, and that affections of the tear-duct, the

lachrymal apparatus and the conjunctivæ are frequently caused by diseases of the nose is well known.

The relationship of diseases of the optic nerve and the eye itself to rhinology has, in recent times, attracted a great deal of attention. Indeed, the literature on the subject is almost unwieldy, and such a gathering as the present appears to me particularly opportune for epitomising the association of diseases of the nose and eye, and indicating how, why, when and where this association may take place.

The anatomical relations will be glanced at presently, when we darken the room for the magic-lantern. As to the routes by which disease can extend from the nasal to the ophthalmic region we will have to-day to consider—

(a) Direct extension, as when a frontal mucocele bulges into the orbit, and a malignant nasal tumour invades it, or a suppurating ethmoiditis bursts into it.

(b) Obstruction and infection of the lachrymal passage, with consequent disturbances in the conjunctive.

(c) Infection of the lymph-channels, causing congestion, discoloration, or redness of the eyelids, or many of the functional disturbances of vision.

(d) Infection of the blood-stream, causing thrombosis of the ophthalmic vein or the cavernous sinus, or hæmorrhagic retinitis, and so forth.

And, lastly, (e) reflex effects.

[Illustrations were then thrown on the screen to indicate some of the anatomical relations of the nose and its accessory sinuses to the orbit, the eyeball and the optic nerve.]

Mr. F. RICHARDSON CROSS said the importance of the relationship of disease of the eye to affections of the nose had been thoroughly recognised for a long time. He said he began his work as a general surgeon, and had operated upon many cases of frontal sinus mischief; and realising the importance of the connection between the work of the nasal surgeon and the ophthalmologist, he had persuaded the Committee of the Eye Hospital at Bristol to have a nasal surgeon associated with the staff. Every practical ophthalmic surgeon would acknowledge the help that could be obtained from the rhinologist in dealing with sinus cases. Some cases of eye disease started in the nose, but his experience was that they are not very common; it was generally fairly obvious where the main centre of the disease lay, whether it was primarily a nose or an eye condition—though, no doubt, some were on the border-land, and the best line of treatment might be uncertain. All forms of sinusitis, particularly in frontal and anterior ethmoidal disease, might implicate the orbit; while inflammation of the sphenoidal or posterior ethmoidal cells might be expected to involve the optic nerve at the apex of the orbit or in the optic chiasma. But evidence of implication of the nerves of sight is usually absent—definite abnormality of the optic disc is rare, because of the distance of the disease behind the eyeball; though some haze or pallor of the papilla may be present, especially if there is extension into the orbital cavity. There may be complete absence of defective movement, or of tenderness in the eyeball. The most valuable test in these cases is by the perimeter; diminution in the temporal field, chiefly in its upper quadrant, suggests pressure on the chiasma, or intra-cranial portion of the optic nerve, as they lie in the sphenoid bone—while implication of the nerve at the foramen, or in its orbital portion, may cause peripheral narrowing

of the field, or more probably a central defect, because the very delicate axial fibres are those most readily affected by the pressure. Mr. Cross illustrated his remarks by lantern-slides showing charts of the visual fields in different cases.

Dr. TAYLOR showed slides illustrating a case of acute frontal sinus suppuration. It was originally admitted to hospital as a case of cerebral tumour. Three weeks after operation on the sinus there was great improvement, and the patient was quite well in six weeks.

The PRESIDENT and Mr. A. J. M. WRIGHT showed some slides. Mr. Wright remarked that he considered there was always a certain amount of risk to the orbit in ethmoidal operations.

Dr. MATHESON MACKAY said that after a certain amount of work, both on the eye and nose, his experience had been in accordance with that of Mr. Cross—that these cases do not occur very commonly, and are more frequently reflex than suppurating cases. Pressure in the nose might be associated with eye symptoms. In a case where Lack's operation had been performed for polypi there was excessive bleeding, and after the patient had been put to bed she complained of defect in vision, and optic atrophy was discovered; eye symptoms had not been looked for previously. He thought that the naso-pharynx should be included in the examination, and also the influence of adenoid vegetations upon the eye. These he had found to be associated with follicular enlargement in the conjunctiva, and their removal had cured the symptoms.

Dr. G. F. C. WALLIS made the following remarks: In accessory sinus affections Berger and others have recorded abnormalities in the periphery of the visual fields, whilst Birch-Hirschfeld lays stress upon the presence of central scotoma. Henrici, Haffner, and Hinkel found nothing abnormal. During the past two years I have examined some forty-five cases of sinusitis, and, excepting four, all showed very definite affections; whereas in a smaller number of cases of simple and atrophic rhinitis and deflected septa, when uncomplicated by sinusitis, no defect occurred. The large majority of these observations were made in chronic, and a few only in acute, cases. Speaking generally, two sets of symptoms are observed in chronic sinusitis, the more usual being peripheral field contraction without other ocular signs, the other variety presenting a similar train of symptoms to those occurring in acute suppuration, peripheral contraction, central scotoma, and optic neuritis.

In sixteen cases of sphenoidal and posterior ethmoid sinusitis, eleven being bilateral, general peripheral field contraction occurred in all. In addition ten cases showed marked temporal contraction, of which seven were bitemporal and one a bitemporal hemianopsia. Of three bilateral frontal suppurations, two showed marked general peripheral contraction, the other, in which the sinus was very large, some bitemporal contraction. In ten antral suppurations, eight showed general peripheral contraction; one, a patient, aged fourteen, had normal fields, and in the other slight temporal contraction was alone present. In twelve cases of polysinusitis, where most of the sinuses were involved on one or both sides, all showed either temporal or general contraction. Nasal contraction was not observed, but altitudinal, either alone or in addition to other, contraction was present in ten cases, three in sphenoidal and seven in polysinusitis. In these cases the field for white has been least affected, then that for red and green most of all. I now always use white and green for test objects.

Central scotoma was observed five times, all occurring in the posterior

group, of which three were acute and two were chronic suppurations. In three of these optic neuritis was present. An island field of vision developing into a ring scotoma occurred in the case of chronic sphenoidal sinusitis which Mr. Russ Wood and I recorded in the *Lancet*.

Normal fields were found in the following conditions: Frontal and ethmoidal mucocoeles, deflected septa, simple and atrophic rhinitis. In two cases of atrophic rhinitis associated with sphenoidal sinusitis, temporal and general contraction occurred. In a case of atrophic rhinitis which appeared to be due to sphenoidal sinusitis, in spite of normal fields I opened the sinus and found it healthy. This, together with the characters of the field defects, and only partial recovery with successful treatment of the chronic sinusitis, conclusively proves in my opinion that field anomalies are not reflex in origin. The cause is, I think, a mild local toxæmia. In chronic sinusitis, without obvious ocular symptoms, the toxin soaks slowly though the sinus wall and directly affects the optic nerve, with the result that the nasal part of the nerve, being in closest relation to the sphenoid-ethmoid sinus, is the most affected, and temporal contraction results. In the fronto-antro-ethmoid group the nerve is not in direct contact with any sinus wall, and the toxin becoming diffused, the circumferential fibres being equally affected, general contraction results. Central scotoma does not result in these cases; the macula bundle, being axial in position, is protected by the circumferential fibres.

In acute supuration the toxins are carried by the vessels, larger quantities reach the nerve, causing œdema of the nerve-sheath, with consequent nerve-pressure, and the field becomes contracted; in addition the more severe cases show central scotoma. In chronic suppurations with central scotoma and other acute ocular symptoms, the passage of toxins is probably favoured by some anatomical variation or incomplete bony wall. For the production of bitemporal hemianopsia the optic chiasma must be involved; it is, however, uncommon, because, as pointed out by Lawrence, the optic chiasma is rarely in relation to the roof of the sphenoid sinus. Mucocoeles, being sterile, are presumably free from toxins, hence the normal fields. If this view be correct, then the presence of central scotoma as observed by some authors, and peripheral contractions by others, is explained.

To assign definite field contractions to individual sinuses is difficult owing to the frequency of polysinusitis and the varying anatomical relations. Suppuration in the posterior group gives rise to marked temporal contraction most frequently, whilst bitemporal hemianopsia, after excluding acromegaly, is diagnostic; central scotoma only occurs in this group, the result of either acute or chronic sinusitis when acute ocular symptoms supervene. General contraction, as the chief characteristic, is the rule in the anterior group, and pronounced temporal contraction the exception. When the symptoms are acute, efficient treatment of the sinus leads to rapid and complete recovery of the field anomalies. The field defects only show slight improvement, as a rule, after successful treatment of a chronic sinusitis, because the nerve has been permanently, although slightly, damaged. As optic atrophy has only resulted in two cases of this series the toxin must be of a mild character.

The presence of field contractions in a suspected sinusitis is, I think, of some help in confirmation of the diagnosis, but it is open to some fallacies. If the colour-perception be weak, the colour field will be considerably contracted even with healthy sinuses; in young people

neurasthenia and hysterical manifestations are apt to develop in chronic sinusitis which cause modifications of the fields.

The PRESIDENT expressed the indebtedness of the Section to Dr. Thomson and Mr. Cross for their kindness in opening the discussion. Many interesting points had been brought out. His experience led him to the conclusion that, speaking generally, temporal contraction of the visual fields was usually due to sphenoidal sinus and posterior ethmoidal cell disease, while general contraction was more commonly associated with frontal sinus and maxillary antral suppurations. They had learnt a great deal with regard to the diagnostic significance of these signs, but he considered there still remained a good deal of work to be done on the subject before they could be on a sure basis, and views must frequently be exchanged between the rhinologist and the eye surgeon.

Dr. DUNDAS GRANT remarked: Since Dr. Christian Holmes, of Cincinnati, read his famous article on this subject, with the well-known transverse vertical section of the head showing the relation of the optic and ocular nerves to the sphenoidal sinuses, there has been no lack of contributions to the illustrative pathological relations existing between the eyes and the accessory sinuses of the nose. In many instances the influence of minor affections of the nose upon the refractive and secretory mechanisms of the eye has been considerably exaggerated, but the importance of the association is unquestionable, and there is a growing tendency on the part of oculists to call the rhinologist into counsel in many instances when the purely ophthalmic methods of treatment show themselves less rapidly efficacious than usual.

I remember the case of an elderly woman sent to me at the Central London Throat and Ear Hospital on account of intractability of her recurrent iritis, which rapidly answered to treatment after the removal of the anterior extremity of a hypertrophied middle turbinal. No doubt the pressure exercised by the swelling interfered with the venous and lymphatic circulation of the parts. Many of those present may recollect two cases I brought before this Section in 1909, in which retrobulbar neuritis, which was apparently not subsiding, appeared to be rapidly and beneficially affected by the removal of the hypertrophied posterior portions of the middle turbinals; this had been done for the purpose of affording access to the sphenoidal and posterior ethmoidal cells for exploration and treatment. In the same year I showed, with Dr. Dan McKenzie, a case in which curetting the ethmoid had been followed by a retrobulbar neuritis interfering with the vision of the left eye. In this case I opened the left sphenoidal sinus according to Hajek's method, which includes opening the corresponding posterior ethmoidal cells. The operation was followed by rapid improvement in the vision of the eye, which ultimately became normal. The curetting had probably resulted in weakening or breaking down the barrier of bone between the posterior ethmoidal cells and the optic nerve, and the injurious effect was counteracted by the free opening the subsequent operation afforded.

In the discussion of my cases Dr. Hawthorne raised the very interesting question as to why disease of the ethmoidal cells should affect the retrobulbar portion of the nerve and should exercise a selective action so as to confine its attack to the papillo-macular bundle. Professor Fuchs describes this behaviour of the nerve-fibres as paradoxical; he explains it by a peculiar vulnerability connected with the specially exquisite and delicate functions of this bundle, with which, perhaps, there is associated a correspondingly delicate anatomical structure.

Professor Fuchs advises in regard to the treatment of retrobulbar neuritis, "above all the consideration of the causal factor (the nose)."

Another interesting problem, brought forward by Mr. Westmacott, was the explanation of the disappearance of an optic neuritis on one side after surgical opening of the suppurative antrum on the other. I suggested it as possible that the diseased antrum was in pathological continuity with the posterior ethmoidal cells, and that these cells, as often observed by Onodi, extended over the sphenoid to the opposite optic canal, the barrier being in such cases exceptionally thin and, therefore, exceptionally favourable to extension of disease.

The interference with the nasal duct by disease of the nose seems extremely natural, and it may lead to suppuration in the lachrymal sac, just as conversely a dacryocystitis may penetrate into the nose and produce symptoms resembling those of nasal sinus suppuration. I have seen several cases of epiphora markedly benefited by even very mild treatment of the inferior turbinal and inferior meatus of the nose. In some cases more active measures have been required.

Intra-nasal operation may at times be the cause of lachrymal trouble, and I have narrated before the Section a case in which the use of an exceptionally sharp rectangular knife for opening the antrum through the nose led to traumatism of the nasal duct, which produced epiphora of about a week's duration. I have recently had under observation a case in which this accident took place when a similar method was being practised by another surgeon, and in which extreme narrowing of the lower orifice of the duct seems to have resulted. Fortunately the nasal duct lies very far forward in relation to the antrum, and it is very rarely injured.

The grosser forms of extension of disease from the one part to the other have probably received adequate attention, and I have referred only to the less obvious instances which have come under my own observation. The reconsideration of the whole subject was well worthy of the Section, and no one was calculated to do it more justice than Dr. StClair Thomson.

PROCEEDINGS OF THE AMERICAN LARYNGOLOGICAL, RHINOLOGICAL, AND OTOLOGICAL SOCIETY.

Seventeenth Annual Meeting, Atlantic City, June 1, 2, and 3, 1911.

Report by DR. L. M. INGRAM.

Thursday, June 1, 1911.

DIRECT LARYNGOSCOPY.

By DR. E. FLETCHER INGALS (Chicago).

The procedure of direct laryngoscopy has not yet come into universal use by laryngologists, the majority of whom favour the older indirect method. The reasons for this are: (1) The necessity for special and expensive instruments. (2) The difficulty of keeping the apparatus in

order, especially the lighting system, when it is not in constant use. (3) The time consumed. (4) The limitations of the method as regards certain cases. These objections far outweigh the advantages in the majority of cases in which inspection of the larynx is made, and in a large percentage of cases where operative measures are to be adopted. There are many cases, however, in which direct laryngoscopy is of great value. The chief indications for direct laryngoscopy are as follows: (1) For the removal of impacted or embedded foreign bodies in the larynx, and the recovery of those that are in positions inaccessible by the indirect method. (2) For diagnosis of laryngeal conditions in infants and children in whom the indirect method cannot be employed, as in the presence of papillomata, stenosis, malformations, etc. (3) For the inspection of certain parts of the larynx or trachea that are invisible by means of the mirror, and for the treatment of lesions in such localities. (4) When a better view of a condition is desired than can be obtained by the indirect method. The chief contra-indications are high-grade dyspnoea from various causes, uncompensated heart lesions, aneurysm of the aorta, myocarditis, arterio-sclerosis of considerable degree, conditions causing high blood-pressure, extreme weakness, severe hæmoptysis. Preparation of the patient consists in abstinence from food for six hours, and from drink for two or three hours previous to examination. The position of the patient is the upright or recumbent, the latter being preferable in children because they can thus be held better. Atropine and morphine given two hours before the operation lessen the secretion and quiet the patient. Edema of the larynx is to be guarded against after the operation, especially in children. Tracheotomy may be necessary. The croup tent is of value in the after-treatment of these cases.

ENDOSCOPIC TREATMENT OF ASTHMA.

By DR. WOLFF FREUDENTHAL (New York City).

For the past three years the author has been treating, endobronchially, various diseases, such as chronic bronchitis, pulmonary tuberculosis, and especially asthma. The present communication dealt solely with this method of treatment in cases of so-called essential asthma, otherwise known as bronchial or reflex asthma. The aetiology of this form of asthma was briefly discussed. Four cases treated by the endoscopic method were detailed, and seven others mentioned. Out of the total of eleven cases treated endobronchially, eight were considered cured, three greatly improved, and two not benefited at all. It would appear that these data compare favourably with the results obtained by other methods.

In all the cases bronchoscopy was employed under local anesthesia, the patient being kept in the upright position. The treatment was undertaken in the morning, the patient's stomach being empty. Some pain always followed bronchoscopy, in some cases lasting three or four days, in others only a few hours. The author was convinced, from his repeated endobronchial examinations, that there are asthmo-genous points in the bronchi as well as in the upper respiratory tract, and that by attacking these points directly by topical applications the foundation could be laid for a new means of combating the disease.

Dr. RICHARD HALL JOHNSTON (Baltimore, Md.) said the straight method of direct laryngoscopy was particularly valuable in infants, young children and adults under general anesthesia. He never employed anesthesia of any kind in infants and young children, as it is dangerous

up to five years of age. The method of procedure was as follows: The little patient was pinned in a sheet so that the arms and legs were practically immovable. He was then placed on the table with the head in the straight position. An assistant held the head, while nurses looked after the arms and legs. The operator stood at the left of the table facing the patient, and holding the modified Jackson speculum in the left hand. The mouth was forced open if necessary. In adults with short thick necks the entire larynx was sometimes not seen; in such a case an assistant was told to push the thyroid cartilage back, when in most cases the anterior commissure would come into view. When direct laryngoscopy is performed in the sitting position the head was extended slightly, and turned to the right or left. The instrument was introduced between the bicuspid teeth, the tongue pushed to the side, and the epiglottis pulled forward. If the anterior commissure was not seen the nurse was instructed to push the head forward until a straight position was reached, when all parts of the larynx are seen. The force required to manipulate the instrument is slight.

DR. G. HUDSON-MAKUN (Philadelphia) asked whether it was customary to give atropine before the operation as suggested by Dr. Ingals. In the case just reported by the speaker $\frac{2}{100}$ gr. of atropine was given. There was not a particle of secretion at the end of the tube during the operation, which lasted an hour. There was no closure of the glottis during the direct laryngoscopy preparatory to putting in the bronchoscopic tube, so that it was not necessary to wait for the larynx to open, as directed by Jackson in his book. He also asked whether the sphincter-like closing of the glottis was always noted. It was with great difficulty that he was able to remove the tube at all on account of the spasm of the glottis. Perhaps the tube was too large for the glottis in this case. There was a very strong grip on the tube, which came out with a snap. He asked Dr. Freudenthal whether the operations which he had described were done in his consulting room, and whether the patients were immediately allowed to go home. What anæsthetic was used in the last case? Did Dr. Freudenthal recommend a general anæsthetic and the employment of the bronchoscopic method in the treatment of asthma in nervous individuals? Did he consider this so important a method in the treatment of this condition as to warrant the giving of a general anæsthetic?

DR. B. R. SHURLEY (Detroit, Mich.) thought that the indirect method was evidently a passing one, and this he noted with some regret. Coincident with the passing of this method, deftness of manipulation was also passing, because this method called for the nicest technique of any in laryngology. He emphasised the fact that there were still some cases in which the indirect method was preferable. In asthma the relief in many cases is in indirect ratio to the amount of secretion which is stirred up apparently by the manipulation. Asthmatic cases might be classified into those which were due to the nasal conditions, those of bronchial origin, and those which were entirely of systemic origin. The indiscriminate use of the bronchoscope was not a proper procedure in the treatment of asthma. The bronchi could be reached by intra-tracheal injection as well as by the more severe manipulation necessitated by the use of the bronchoscope. Of course it might be important to investigate by means of the bronchoscope, and to determine the nature of any lesion that may be present.

DR. GEORGE L. RICHARDS (Fall River, Mass.), referring to the question of giving an anæsthetic to children in making a bronchoscopic

examination, cited a case in which he came near to losing a patient. The anæsthetic was given and the instrument passed, when the child suddenly ceased to breathe. The tube was withdrawn and breathing re-established, but the only reason for the child's being alive was that tracheotomy had already been done.

Dr. THOMAS J. HARRIS (New York City) considered tracheotomy of decided advantage. One must reckon, however, with a series of cases in which good results could not be obtained in this way, cases in which there was a good deal of ossification of the cartilage, and where the neck was so stiff that the parts could not be seen without a general anæsthetic. In such cases Brüning's contra-pressure instrument had proved of advantage.

Dr. ROBERT C. MYLES (New York City), said the peculiar spasm to which the trachea and the bronchi are subjected in asthma is a habit-spasm due to the constant state of hyperæmia of these parts and to a reflex central irritation. He had been experimenting for several years with tracheal and bronchial medicaments, using adrenalin, menthol, carbolic acid, iodoform, and various other agents in liquid alboline as an injection. Marked relief had been obtained at times.

Dr. FREUDENTHAL, in reply, presented some instruments used by Ephraim for anæsthetising the trachea and bronchi. Referring to the use of atropin, he said he usually gave it in $\frac{1}{100}$ gr. doses, but he had found that it had no effect whatever upon the secretion. It was necessary, of course, to differentiate between foreign body and asthma. He had made a few bronchoscopic examinations in the clinic, but they were unsatisfactory. It was better to do it early in the morning, before the patient had any breakfast. Anesthol, to which he referred, was composed of equal parts of ether, chloroform and alcohol. As a rule he did not use a general anæsthetic. He agreed that the bronchoscope stirs up secretion. Referring to Dr. Shurley's suggestion about a classification of cases, he called attention to the fact that he had done this in the paper. He would not, for example, employ this method in a case of uterine asthma. Answering a question as to how a cure is obtained, he said it was difficult to tell. Surely a single introduction of the bronchoscope could not cure asthma, unless by auto-suggestion. Orthoform or propesene emulsion were indicated where there is superficial erosion. The soreness was thus relieved, and the patient made more comfortable. He manufactured less phlegm than usual when the bronchoscope was introduced. In the absence of ulceration or soreness he used adrenalin, to which he added two to three drops of oleum menthol pip.

FIBROUS POLYPS OF THE NASO-PHARYNX.

By Dr. WALTER A. WELLS (Washington, D.C.).

Fibrous polyps in the naso-pharynx are comparatively rare, and should not be confused with sarcomatous growths in this locality. A genuine fibrous polyp occurs as a rule singly, and is a large, firm, smooth, opaque growth, made up of dense connective tissue, and attached by a firm pedicle. It occurs almost wholly in children, and most frequently in boys. It is evidently a benign growth, never giving rise to metastasis or glandular involvement, not accompanied by true cachexia, seldom recurring, and apparently in certain cases in later life undergoing spontaneous retrogression. The various theories concerning the origin of these growths were briefly outlined. Without attempting to decide which

of the theories is correct, the author emphasised the futility and insufficiency of the mere clinical observations to decide these particulars. A report based upon a *post-mortem* examination would be much more trustworthy than an opinion based upon rhinoscopy or digital examination. The ultimate termination of naso-pharyngeal polyps, in the absence of surgical intervention, was another subject for discussion.

Calcification, serious infiltration, cystic degeneration, sloughing, sarcomatous degeneration, atrophy and retrogression are the various possibilities. These tumours frequently grow to an enormous size, producing dilatation of the nasal fossæ, spreading of the nasal bones, and inducing serious deformity. Posteriorly this expansion causes a forward protrusion of the soft palate, and interference with its normal action. Articulation, deglutition, and respiration are interfered with, dyspnoea and anaemia may result: the patient may suffer from dysphagia and become emaciated, and serious hæmorrhage may occur. Immediate removal of the growth is imperative under such circumstances. The methods for the removal of naso-pharyngeal polypi were classified as follows: (1) Those in which access to the tumour was obtained by some preliminary cutting operation, the growth being removed through the artificial route thus created; (2) those in which the tumour was treated or extracted through the natural passages, the nose or mouth. The crude methods of treatment advocated and practised by many surgeons were attended with serious consequences. Radical, mutilating operations were apparently unnecessary. Electrolysis, the cautery snare, and ignipuncture were open to serious objections, and so were the various caustic agents. The author advocated the use of a heavy wire snare, so constructed that great force could be employed. With a little ingenuity it was always possible to manipulate the wires to engage the growth close to the place of attachment, so that the tumour could be removed *en masse*. A clean severance of the tumour without injury to the surrounding parts, without shock, without hæmorrhage and without subsequent sloughing, were the advantages claimed for this method. Recurrence was no more frequent after its use than from other methods.

NASO-PHARYNGEAL FIBROMA.

By DR. WILLIAM B. CHAMBERLIN (Cleveland).

Naso-pharyngeal fibromata arise from the fibrous tissue covering the basilar process of the occipital bone as well as from the sphenoid bones. They are exceedingly hard and dense, rich in blood-supply, and possess a marked tendency to rapid growth, frequently invading the nose, its accessory sinuses, and even the cranial cavity. For this reason they are dangerous to life and demand destruction or removal. Histologically they consist of fibrous tissue, with occasionally a suggestion of sarcomatous degeneration. They do not form metastases. Males are more frequently affected than females, and between the ages of ten and twenty-five years. After twenty-five there is a tendency to spontaneous disappearance. Fibromata of the naso-pharynx must be differentiated from choanal polypi as well as from sarcoma. Death may result from anaemia, due to hæmorrhage, or from meningitis, as the result of extension into the skull-cavity. Treatment may be palliative or radical. Cure is effected in certain cases by electrolysis or galvano-cauterisation. Removal could be accomplished through the natural passages, the nose and the

mouth, or, in extreme cases, after a preliminary tracheotomy and resection of the superior maxilla.

Dr. HARMON SMITH (New York City) called attention to the frequency of error in hospital records with reference to the cases under discussion, many cases which are called intra-nasal fibromata being in reality myxomata. He recalled three cases which had been treated by injections of mono-chloroacetic acid. All of them made perfect recoveries. Seven years ago he had modified Collin's syringe by making the needle longer, so that the acid could be injected deeper into the tissues. He protected the needle by a jacket, which concealed the point until the location for injection had been reached, when, at the will of the operator, the needle could be unsheathed and inserted into the tumour where the injection had been made, the sheath could again be run into place before its removal, and the cup-like end of the sheath would catch the excess of acid that might exude upon withdrawing the needle. The sheath protected the soft palate and adjacent structures against injury from the needle while in the act of reaching the tumour. In another case the first attempt to remove the growth was unsuccessful. The screw of the snare broke, and for a while it seemed impossible to disengage the snare loop, but by main strength the wire was drawn through the growth, and it was completely removed. The case recovered, although the operation was followed by considerable hæmorrhage. It seemed inadvisable to adopt the major surgery formerly resorted to in these cases. There was just as much danger from radical surgery, or from the wire loop, as from the manipulation of the acid.

Dr. D. J. GIBB WISHART said his experience with the cases under discussion was extremely limited. In operating upon these cases one should not confine one's self to any one line of procedure. It was necessary to determine the point of origin of the growth as well as that to which it has extended, and proceed accordingly. Where the growth had extended into the sphenoid sinus, for example, or into the antrum, a different line of treatment should be followed from that employed where the growth was adherent to the walls of the nasal cavities, pushing downward. If it was in the nasal cavities it was more easily removed than when it had invaded the antrum or the sphenoidal cells. In the latter event one must adopt a radical procedure. When this was necessary it should be borne in mind that the growth must be removed in its entirety, including the pedicle. Where the growth is adherent to the sides of the nasal cavity, removal was difficult unless a part of the turbinals was also removed. In this event a procedure should be adopted which would give as little scar as possible. Even the radical operation leaves no more scar than was formerly left by other procedures. The absence of scar in a well-done Killian operation on the sphenoid is remarkable, and curved incisions on the side of the nose leave very little scar. In the operation suggested by Watson-Williams, which none of the speakers had mentioned, a part of the Killian incision was adopted. The side of the nose was laid open and a part of the turbinal bone removed, healing resulting without scar. In dealing with hæmorrhage in these cases, he was disposed to open the crico-thyroid membrane and to give an anæsthetic through the opening, then to pack the pharynx with sponges. He had adopted this procedure in several instances in operations on the nose where great bleeding was to be anticipated.

Dr. SWAIN (New Haven, Conn.) said the only case he had had in a young girl proved to be almost identical with psammoma. No snare would cut through it. He was unable, under general anæsthesia, to wrench

it out by means of large forceps, and it bled hardly a spoonful. It was found to be very poor in blood-vessels with a great deal of fibrous stroma, very much like a uterine fibroma. In this tissue, scattered in smaller and larger masses, were the hard sand-like particles. He had tried to remove another naso-pharyngeal fibroma, and he had never seen greater hæmorrhage than resulted in this case, except where the longitudinal sinus was cut. Packing through the posterior nares and the injection of salt solution saved the patient's life. In another case upon which he had operated, the tumour, which was poor in blood-vessels, came out very easily. These tumours vary from those which are very easily enucleated to those which are practically irremovable.

Dr. JOSEPH A. WHITE (Richmond, Va.) cited the case of a boy, aged eighteen, sent to him by a doctor who had broken all his snares in an effort to remove the growth. The patient had a typical frog-face. The whole right side of the nose was filled with the growth, and the post-nasal spaces were partly filled. The difficulty was to encircle the growth with a snare at all. His experience had been that no wire would stand the strain in a case of this kind. He used a No. 9 piano wire, turning the nut very slowly, but finally reached a point when it would not turn at all. He surmounted this difficulty by using an irido-platinum wire. After cutting nearly through the growth by this means, it can be completely removed by the use of the electro-cautery. He never passed a snare through the nose, but always through the mouth. As large a loop as desired might be used in this manner. He described a method by which the difficulty of passing a wire loop through the nose could be avoided.

Dr. LEWIS A. COFFIN (New York City) had been successful in several cases with monochloroacetic acid. In one case nearly the whole of one of these tumours was removed by means of a strong cold wire. Great hæmorrhage followed, the patient being almost exsanguinated. The growth recurred, being apparently sessile. He suggested the use of monochloroacetic acid by means of his syringe. This was done over a considerable period of time, the growth was entirely removed, and now, after a lapse of three years, there was no recurrence. He had had other cases in which the same treatment had proved equally successful. In tumours which were cystic the acid did not act so well. It was difficult to use the needle because of the danger of catching it in the contiguous tissues. The patient must be able to assist by holding the tongue. If the treatment could be carried out it is generally successful.

Dr. J. A. STUCKY (Lexington, Ky.) had never seen a case of multiple fibroma. Three out of nine of his cases were lobulated, but none were multiple. Neither had he ever seen a fibroma which any snare would cut through. He had a modification of the Jarvis snare, as long and strong as any tonsil snare, and had succeeded in getting the loop over the growth, but, despite the fact that it was kept on for twenty-four hours, and that the nurse turned the nut every five or ten minutes, a point was always reached at which it would not turn. He had taken ordinary plumber's forceps to turn it with, and every time had broken the snare. Finally, the wire had to be cut in two, the cannula slipped off, and the growth ultimately removed with the forceps. He had used forceps in five cases, the forceps employed being a modification of the old Brandagee forceps. By tying the soft palate forward he could get a good view of the growth. He then inserted the left blade of the forceps, then the right, and then locked them. With the mirror he looked to see that he had secured the growth. It was better to tie the carotid artery beforehand, but

whether this was done or not, the tampon cord should be inserted through the nostril, with the post-nasal tampon ready for use. The growth should be loosened, as a dentist loosens a tooth, before the attempt was made to remove it. He had found that one post-nasal tampon was sufficient, and when this was removed in twenty-four or forty-eight hours there was no secondary hemorrhage.

Dr. JAMES F. LOGAN (Kansas City, Mo.) emphasised the importance of a thorough pathological examination of the growth previous to operation in order to obviate mistakes in diagnosis. He had had six cases of nasal tumours of the type under discussion. Two proved to be fibro-sarcoma. In each case the report from the first pathological examination was nasal fibroma, and, after removal of the deeper portions of the growth, the second report was fibro-sarcoma in two of the cases. For the removal of a naso-pharyngeal fibroma with a pedicle not attached to the adjacent tissues he used a surgeon's chain écraseur, introduced behind the growth through the mouth. In cases of fibro-sarcoma or sarcoma he had made up his mind never to attempt to remove the growth by other methods than electrolysis. In one case in which he removed a spindle-cell sarcoma attached to the body of the sphenoid by means of morcellation and the snare, he only succeeded in clearing the growth in the nose at the expense of a terrific hemorrhage, even after ligation of the common carotid. It was necessary to transfuse normal salt solution in order to resuscitate the patient. Recurrence of the growth took place within five months. In two cases in which he had removed the growth by electrolysis there had been no recurrence.

Dr. LINN EMERSON (Orange, N.J.) had had a case of this kind in a child, aged eleven, who had already been operated upon for adenoids. He gave calcium chloride before and after the operation. Under ether anesthesia he could not get the snare around the base of the growth, but, by means of the largest Brandagee forceps, twisted it and got it out. Alarming hemorrhage followed removal of the growth, but it was controlled.

Dr. CHARLES S. MEANS (Columbus, Ohio) reported a case of naso-pharyngeal fibroma which filled the posterior nares and the vault of the pharynx so completely that he could not use any instrument except the forceps. The turbinates were enlarged and the septum was deviated, so that it was impossible to see or operate through the nose. The patient was a boy, aged fifteen. Breathing was laboured on account of the obstruction, the tumour being so large that it filled the pharynx and came in contact with the tongue. It was impossible to get any instrument or wire loop through the nose beneath the soft palate. He therefore seized the growth, and by force extracted it *en masse*. It proved to have two pedicles. Its dimensions were $2\frac{1}{2}$ in. long, $1\frac{3}{4}$ in. wide, and $1\frac{1}{4}$ in. antero-posteriorly. Very little hemorrhage followed the operation, and there has been no recurrence after five years.

Dr. WELLS, in reply, said that concerning the use of forceps, he believed the reports which had just been made, together with those in the literature, confirmed the position he had taken, namely, that such instruments were to be avoided, and that the snare was the instrument to use. Perhaps he had been fortunate in his three cases, but he did not think there are any pedunculated cases which cannot be removed by a snare made strong enough. Any fibrous polyp which could be removed with forceps could be removed with the strong snares now in use.

INTERNATIONAL CONGRESS OF MEDICINE AT BUDAPEST.

SECTION OF LARYNGOLOGY AND RHINOLOGY.

(Continued from p. 492.)

ADENOID VEGETATIONS.

By DR. CITELLI (Catania).

The author does not look upon the tonsils as belonging to the organs which furnish an internal secretion. He thinks that hyperplasia of the naso-pharyngeal tonsil leads first of all to functional and then to anatomical disturbances of the pharyngeal and central hypophysis. He employs for the removal of laterally situated adenoids a very small model of the *Delstauche* ring-knife.

THE PHARYNGEAL HYPOPHYSIS IN CHILDHOOD, AND ITS RELATIONSHIP TO THE PHARYNGEAL TONSIL AND TO THE CENTRAL HYPOPHYSIS.

By DR. CITELLI (Catania).

The author has found the pharyngeal hypophysis frequently in children. Its length varies from 1 to $3\frac{1}{2}$ mm. It often exhibits a circulatory relationship with the pharyngeal tonsil, and also with the central hypophysis.

ADENOID VEGETATIONS AND THE HYPOPHYSIS.

By DR. CITELLI (Catania).

The author has determined the following points: (1) The circulatory relations between adenoid growths and the pharyngeal hypophysis are more extensive than in normal pharyngeal tonsils. (2) The hypophyseal system as a whole (pharyngeal and central hypophyses) appears to be almost always hypertrophied when adenoid growths are present.

THE COMPLICATIONS OF OPERATIONS FOR THE REMOVAL OF TONSILS AND ADENOIDS.

By DR. BOURACK (Charkoff).

The author advises attention to aseptic technique, and recommends keeping the patient in bed for several days after operation.

THE LOCAL ANÆSTHESIA OF TONSILS AND ADENOIDS.

By DR. RUPPRECHT (Bremen).

The most effective method is to inject the anæsthetic into the faucial tonsils and to paint the pharyngeal tonsil. For the former novocain is best for the latter alypin. The necessity of restricting the quantity of

cocaine used renders it less useful than these other anesthetics. In the case of the faucial tonsil he begins with a superficial injection of a 2 per cent. isotonic solution of novocain and adrenalin into the lower part of the anterior pillar of the fauces, and then he inserts the needle deeper while he continues injecting. Next the superior commissure of the faucial pillars and, along with it, the upper pole of the tonsil are infiltrated. Several more deep injections into the substance of both poles of the tonsil follow. In the case of the pharyngeal tonsil, after spraying it with a 1 per cent. solution of cocaine and adrenalin, he cleanses the nose and introduces through it a slender probe armed with cotton-wool soaked in a 10 per cent. alypin and adrenalin solution, which he applies to the upper margins of choanae and to the adenoid region. He then makes his patient lie down with the head rather low, and paints again both sides twice during a period of from eight to ten minutes. He has followed this plan in 355 operations for adenoids and in 196 tonsillectomies.

Dr. LEVI (Florence) believed that the pharyngeal portion of the pituitary body had a considerable influence on the production of acromegaly. For that reason the tissue of the naso-pharynx in which the hypophysis is included should be spared.

Dr. PEPPI (Bologna) thought that those cases in which removal of adenoid vegetations had some effect upon the general constitution, and in which nasal respiration had not been hindered, could be accounted for by assuming the existence of an abnormal vascular connection between the pituitary and the pharyngeal tonsil, through the *canalis cranio-pharyngeus*.

Dr. LOGAN (Kansas City) had operated on more than 700 patients between the age of twenty-five and fifty-nine. He considered it important to remove even the smallest trace of adenoids, because of their influence upon chronic deafness and upon the recurrence of acute disease of the upper air-tract.

Dr. JOACHIM (New Orleans) followed Moritz Schmidt's plan of insufflating a powder consisting of one part of cocaine to five parts of sugar of milk in order to anesthetise the adenoid area.

Dr. KOSCHIER defended the use of general anesthesia. Safety was ensured if the reflexes were not abolished. The general anæsthetic prevented pain and reduced shock, besides rendering it possible to operate with more exactness and certainty.

Dr. BOURACK (Charkoff) did not consider it advisable to risk a general anæsthetic in this operation.

Drs. GLEITSMANN (New York) and CITELLI (Catania) preferred general anesthesia and used bromide of ethyl for the purpose.

EXPERIMENTAL PHONETICS FROM THE MEDICAL STANDPOINT.

By Drs. ZWAARDENMAKER (Utrecht) and BOUMANN (Amsterdam).

The following is adapted for immediate clinical use:

(1) The measuring of the capacity for respiration and the registration of expiration by which either the muscular movements or the rapidity of the air can be recorded.

(2) The registration of articulation according to the different methods described by the author.

(3) The use of the phonograph as, *e. g.*, in testing the hearing power for conversation.

Dr. Boumann had experimented with Zwaardemaker's apparatus on himself and on twenty-two patients with the following results: No striking difference was found in what was already clinically known. Only with regard to cases of aphasia could any exception be made. While cases of bulbar paralysis, multiple sclerosis and dementia paralytica showed anomalies, none could be demonstrated in the curves taken in cases of aphasia. Now and then there were some words, or, it might be, only one word, which could generally be pronounced, but this word showed, as its registration demonstrated, no anomalies of the muscular movement. This supports the idea which absolutely excludes in aphasia any peripheral affection.

Dr. GUTZMANN (Berlin) said that diagnosis, based upon the laryngeal mirror, was incomplete in many cases, and especially in functional disturbances of phonation. He added that in 1891 Goldscheider had employed methods of experimental phonetics in the investigation of the speech disturbances found in bulbar paralysis, and further remarked that he himself, partly in association with Goldscheider, had invoked the same methods in the investigation of dialects and errors in speech.

Dr. FLATAU (Berlin) had also employed them in singers. An interesting and hitherto unexplored region was that of vicarious articulation. The question of the registers could not be solved if we limited our attention to the optical diagnosis. There were several transitional forms.

Dr. KATZENSTEIN (Berlin) measures the volume of the breath by means of a celluloid helmet which covered the head, and is provided with valves. Through one valve the air is inspired, and through the other the breath, the spoken and singing-voice pass, and are measured.

TREATMENT OF CHRONIC NASO-PHARYNGITIS AND OZÆNA WITH HIGH FREQUENCY CURRENT.

By Dr. DAVID (Paris).

The length of the spark was 3 to 4 cm., the duration of the sitting two minutes, and the number of sittings averaged thirty. Of twelve cases of ozæna so treated seven were cured, that is, factor and crusts disappeared. Five patients with dry naso-pharyngitis were all cured.

Dr. BROECKHAERT (Ghent) thought that radium, but only in combination with paraffin injections, was a valuable remedy in the treatment of ozæna.

THE OPERATIVE TREATMENT OF CANCER OF THE LARYNX.

By Dr. KOSCHIER (Vienna).

The technique employed by the author in thyrotomy, partial and total laryngectomy is described. After the operation is finished, the whole cavity of the wound is lined with a veiling of iodoform gauze, into which small strips of iodoform gauze are introduced in the manner of a Mikulicz tampon. No sutures are made, and the tampon is fixed solely by means of a lightly compressing bandage, and left in the wound as long as possible. It does not require to be removed for at least ten days. He has used this method of after-treatment in thirty cases of laryngeal cancer. The confidence to be placed in the method, especially with reference to aspiration pneumonia, may be gauged from the fact that only one case of post-operative death fell to be recorded, and that was due to hemorrhage

from an eroded thyroid vein. Nine were cases of thyrotomy, eighteen of partial, and 3 of total extirpation. In all cases he passes a double ligature through the isthmus of the thyroid gland, and divides it in order to prevent hæmorrhage therefrom. Of nineteen cases operated on more than three years ago, nine have remained without recurrence for more than eight years, namely, four thyrotomies, three laryngectomies, and two total extirpations. He advised that the statistical arrangement of cases of laryngeal cancer should be based upon the same principles as those which guided Winter with reference to uterine cancer. Only four groups are necessary: (1) The number of cases examined. (2) The number of cases operated on. (3) The number of post-operative cases; and (4) the number of cases which show no recurrence three years after operation. A comparison of the first with the last group will show what has been achieved by operation.

THE PRESENT POSITION OF THE QUESTION OF RECURRENT PARALYSIS (PARALYSES OF CEREBRAL AND BULBAR ORIGIN).

By DR. BROECKHAERT (Ghent).

(1) *Recurrent Paralysis of Cerebral Origin.*—Some very exceptional observations of unilateral paralysis of the vocal cord in pure cerebral affections have been published, none of which survives strict criticism. If we are to judge from the majority of these observations, then cerebral laryngeal paralysis would have the threefold characteristic of being unilateral, crossed and complete, the vocal cord of the side opposite to the brain lesion lying immobile in the cadaveric position. According to some other cases observed the paralysis was incomplete, since the affected cord lay in the median position. All experimental research has, however, shown that even the most extensive destruction of the laryngeal centres in the cerebrum suppresses the voluntary movements of the cords exclusively, leaving reflex mobility intact. In animals it is impossible to cause laryngeal paralysis by producing a lesion of the brain: even after removal of both hemispheres the normal respiratory movements remain unaffected, and under the influence of a reflex stimulus adduction is completely effected. The researches of recent years have shown that in the dog, on both sides at the level of the antero-external part of the paraærucial convolution, there is a centre for the different movements of the cords. Electrical stimulation of this centre evokes, as a rule, a bilateral movement; now and again it is possible to produce a contraction—exclusive or preponderating—of the vocal cord of the opposite side. This centre does not represent the actual centre for phonation, but it is the cerebral centre for the accommodation necessary for phonation. According to Katzenstein the spot for the production of phonation is said to be placed in the vicinity of the centre for the voluntary movement of the cords. Bell's centre corresponds to the word centre in man; if it is destroyed the animal is made aphasic; if the centre for movement of the vocal cords is destroyed the animal becomes aphonic.

(2) *Recurrent Paralysis of Bulbar Origin.* According to the researches of the Louvain school it appears to have been settled that, in opposition to the classical view, the centre for the innervation of the larynx is localised in the dorsal nucleus of the vagus. If this is the case in man, then recurrent paralysis of bulbar origin must follow a lesion of this nucleus. For the solution of this problem the pathological data at our disposal in the literature are quite insufficient. The chief charac-

teristics of bulbar laryngoplegia are as follows: (1) It may be unilateral or bilateral according to the side of the bulb which is diseased. (2) The paralysis may either be complete or incomplete. (3) The paralysed muscles atrophy or lose their electrical irritability. (4) The paralysis is often combined with anaesthesia. Although paralysis of the abductors is by far the more frequent, still the greatest variety may be found in the motor disturbances in the larynx: isolated paralysis of the adductors was several times observed. The facts obtained in bulbar affections are, therefore, often contrary to Semon's law.

THE CENTRES FOR PHONATION.

BY DR. KATZENSTEIN (Berlin).

It has long been known that after division of all four laryngeal nerves phonation is still possible—as R. du Bois-Reymond and Katzenstein showed—through the action of the external laryngeal muscles and the muscles of the larynx, or in consequence of the irritation of a region (? in the cortex). Experimentally, or in pathological cases in man, phonation can be effected by the so-called sub-cerebral centres; normal phonation in animals is, however, only induced by the phonation-centre in the cortex. The pathology of the central phonation in man is not affected by the result of experiments in animals. The production of unilateral movements of the vocal cords has been indubitably proved by the investigations of Masini, Katzenstein, Broeckhaert, and Lewandowski.

Dr. LAUTMANN (Paris) drew attention to the fact that, as in paralysis of other nerves (the optic, acoustic and oculo-motor), so also in recurrent paralysis, all the fibres of the nerve are not equally affected.

Prof. OSODI found himself compelled to agree with Semon's conclusion not to attach too high a value to experimental findings. His experimental results are that both in animals and in anencephalic human fetuses, as well as in infants which have been perforated, phonation and the movements of the cords may be preserved intact so long as the region of the medullary respiratory centre is uninjured. This the introducers had corroborated: the only difference appeared in the explanations given. Katzenstein assumed a reflex phonation through the respiratory centre and through expiration. This conclusion did not coincide with clinical experience, for in central paralysis of the vocal cords, in spite of the fact that the respiratory centre and respiration were intact, the cords remained immobile, while in animals after removal of the brain as far as the respiratory centres in the medulla, phonation and the movements of the cords nevertheless remain. For this reason it is upon clinical observations and upon pathological and histological researches that the greatest weight should be placed.

Dr. GLEITSMANN (New York) said that Broeckhaert had cited cases in his paper in which, as a result of a unilateral cerebral lesion, a unilateral paralysis of the recurrent or abductors had been described. Most of these cases had already been analysed by Semon in "Heymann's Handbook," and had been found to be open to criticism. The second and most important point, which, if it came to a conclusion, would bury the whole everlasting controversy of unilateral cortical paralyses, concerned the extremely interesting and valuable experiments of Katzenstein, who had informed us of the discovery of a cortical region, the unipolar irritation of which was capable of inducing unilateral paralysis (*sic*) in the larynx.

(D. M. trans.)

(To be continued.)

Abstracts.

NOSE.

Palleine, Robert (Adelaide).—Nasal Obstruction: its Varieties and Effects. "Australian Medical Gazette," May 20, 1911.

The varieties of nasal obstruction, whether due to malformation of the alae, septal or turbinal deformities, are well described. The effects of nasal obstruction are shown to be very injurious. The middle turbinal forms the operculum covering the ostia of the maxillary antrum, the inferior ethmoidal cells, and the opening of the infundibulum. When the ostia of the sinuses are hermetically sealed by the operculum, the air is absorbed and the sinuses become vacuous. When this is complete the atmospheric pressure gives rise to intolerable headaches of long duration; disturbance of the field of vision may also take place. The swollen turbinate fits so tightly that one sometimes finds, on the removal of the anterior end, a small polyp on the outer surface which has fitted into the infundibulum. The relief capable of being given is one of the most thankful results of surgery. Obstruction in this region of the nose leads to catarrhs, which in ordinary people are only temporary, becoming a permanent sinus suppuration. In most cases of frontal sinusitis nothing is required but the amputation of the anterior end of the middle turbinate, and the resulting ventilation and drainage effect a cure. The effects on the mouth, larynx, and ears are described. People with partial nasal obstruction nearly always snore; with total obstruction only when lying on the back. Nearly everyone who snores becomes deaf. This is due to the night-long effort of the air to get through the tympanic membrane to fill the minus pressure in the pharynx. The effects of the general health are noted, the disturbed sleep and the morning headache, etc. Asthma, paroxysmal rhinorrhoea, and pseudo-angina may be the result of nasal obstruction, and are removable by treatment. Meckel's ganglion is probably the trouble-spreading centre.

A. J. Brady.

Preysing, Prof. (Cologne).—Spongification of the Frontal Sinus. "Zeitsch. f. Laryngol., Rhinol., etc.," Bd. iii. Heft 4.

The author states that on illumination the frontal sinuses are absent in 20 per cent. of normal people. Oppikofer, however, examined 200 cases *post-mortem*, and found the frontal sinuses absent in only 3.5 per cent. By X-ray examination Onodi found these cavities to be wanting in 5 per cent. of individuals (1200 examined). Preysing thinks that absence of the frontal sinuses may be due to a pathological process, and not to congenital defect. The mastoid air-cells may be wanting in normal people, and they may also become filled up in cases of chronic sclerosis of the process due to disease. During this slow sclerotic process there is a stage when the cells are filled by a vascular spongy bony tissue, and Preysing maintains that this stage may be present without any otitis media, and may cause mastoid pain and tenderness; such cases are usually diagnosed as hysterical or neuralgic. The author has found that complete removal of the mastoid process cures these cases. Preysing has observed seven cases of frontal pain in which a radiograph showed that both frontal sinuses were absent, while the ethmoidal cells and maxillary antra were healthy; there were no signs of sinusitis and no hysterical

stigmata: the author came to the conclusion that he had to deal with cases of spongification of the frontal sinuses. Resection of the middle turbinal did good for a time, but the pain returned. In six of the seven cases Preysing did not feel justified in operating, but in the seventh he found on exploration a spongification of the frontal bone, which was blueish-red and bled freely, as in cases of mastoid spongification. The pain, which was absent for a time after this operation, returned later on. All the cases occurred in females, and Preysing is of opinion that puberty may have some connection with the condition. It is interesting to note that in one of the cases the patient also suffered from otosclerosis. *J. S. Fraser.*

Hoffmann, R.—**The Pathology of Maxillary Cysts.** "Zeitschr. f. Laryngol.," Bd. iii, Heft 5.

Dental cysts are divided into (1) follicular and (2) periodontal. The former are due to faulty development of the tooth-follicle, while the latter, the more common variety, are caused by inflammation of the root of a tooth. The wall of a follicular cyst is composed of a thick fibrous layer lined by cubical or cylindrical epithelium, and the cyst-cavity contains the more or less developed tooth which is, of course, absent from the row. The wall of a periodontal cyst is made up of a dense connective tissue, which, at the root of the tooth, passes into granulation-tissue. The root itself projects into the cyst from below. The cavity of the cyst is lined by stratified squamous epithelium, derived from the embryological epithelial cells normally found in the periodontium. As the cyst grows there is resorption of bone in the outer layer of the cyst-wall, while new bone is produced in the deep layer of the periosteum beneath the mucous membrane of the antrum. If the contents of the cyst become purulent the epithelium may disappear. In one case Hoffmann found that the cyst was lined by ciliated epithelium.

Dental cysts may rupture into the mouth, inferior meatus of the nose, into the antrum, or through the skin of the face. The author records a rare case in which a cyst burst into the middle meatus. Finally, Hoffmann states that he has a rare specimen of an inner maxillary cyst. He has nothing new to say in regard to treatment. *J. S. Fraser.*

MOUTH AND PHARYNX.

Bertein, P., and Gellé, E. (Lille).—**Solid Thyroid Tumours at the Base of the Tongue.** "Gazette des Hopitaux," February 21, 1911.

The authors remark that these growths were first described by Wolf in 1882, and subsequently by Chevalier, Le Dentu and Delbet, Makins, Berard, and Stirling. They originate in His's tract, and may be looked upon as aberrant goitres. Cysts occasionally arise in the same structure, but are rarer. The two following cases are recorded: (1) A woman, aged eighteen, was seized with bleeding from the mouth. A buccal examination revealed no breach of surface, but a swelling the size of a large nut was noticed in the region of the foramen cæcum. The mucosa covering it was traversed by a venous plexus. On palpation it was hard and resistant. General health good. Some slight trouble in swallowing. Cervical thyroid normal. The growth was removed by the buccal route, and recovery ensued in a fortnight. Examination after removal showed that

it consisted of two unequal lobes, separated by a connective-tissue septum. The larger consisted of proliferated glandular tissue. Thyroid structure was difficult to find, only vaguely outlined vesicles, very small, and containing a trace of colloïd material being present. The other lobe was clearly thyroid tissue. (2) A woman had suffered for some weeks from attacks of suffocation. When seen she was pallid, her lips were cyanosed, and respiration was difficult and noisy. Pulse 110, temperature 38.5° C. On auscultation, râles were audible all over the chest. Examination of the mouth revealed a swelling the size of a large mandarin orange at the base of the tongue, almost completely filling the oro-pharynx; the mucosa covering it was smooth and rose-coloured; to the touch it was hard and resistant. Deglutition was but little interfered with. Tracheotomy was performed forty-eight hours after the patient presented herself. Respiration and pulse gradually became normal, but the bronchitis persisted. As soon as the chest trouble had cleared up the growth was removed. A Trendelenburg's tampon cannula having been substituted for the tracheotomy tube, chloroform was administered. The soft tissues were then divided by an incision from the symphysis mentis to the upper border of the thyroid cartilage, the hyoid bone was divided and the two segments held apart. After a tedious dissection, removal was effected without injuring the lingual mucosa covering the growth. Haemorrhage was free. Sutures and drainage. Result good. The growth removed appeared to consist of two zones of different consistence: one resembled thyroid tissue, the other was studded with calcareous deposits. Details of the histological examination are fully recorded.

The writers observe that lingual goitres occur at all ages, but especially at puberty. They are more frequently met with in females. Hickmann and Meixner observed two cases in new-born infants; both rapidly succumbed from asphyxia. Usually the growths are insidious in their development, only being incidentally discovered during a laryngeal examination, or when, as in the author's case, such symptoms as hæmorrhage or dyspnoea supervene. The neoplasm may exist a life-time unnoticed. Growth is slow, but sometimes a rapid but temporary development occurs at the commencement of menstruation (Lentlier), and at the onset of influenza (Collins Warren), or whooping-cough (Wolf). In the writers' second case bronchitis appears to have exercised a similar influence. With regard to the method of operating, the writers are not in favour of a preliminary tracheotomy in all cases, believing that Rose's position is a sufficient safeguard against the entry of blood into the trachea; they would reserve such practice for cases where suffocation appeared imminent. Tracheotomy would, however, confer one advantage, in that through the neck incision one might determine the presence or absence of the thyroid gland. In any case search should be made for the latter, seeing that the lingual neoplasm may be the sole representative of both lateral lobes and isthmus of the thyroid gland (Soulié and Verdun), and therefore its removal would be followed by myxœdema. In cases of doubt as to the presence of the thyroid the writers would abstain from operative interference, unless from its size and symptoms the neoplasm became troublesome. They would then only practice a partial excision, taking care to leave sufficient tissue to provide against secretory insufficiency. When the tumour is large and extends far backwards and deeply, extirpation by the buccal route would be difficult, and the supra-hyoid route would be preferable. Removal by the trans-hyoid route, a method adopted in the writer's second case, has its indications. The technique of the several operations is described in detail.

H. Clayton For.

Williams (New York).—The Vaccine Treatment of Pyorrhœa Alveolaris.
 "Amer. Journ. Med. Sci.," May, 1911.

The cases treated by the writer fall into two groups, of which the first includes eight cases, which received autogenous vaccines. In all of these the disease was of long standing, and had been carefully treated by dentists. The improvement following vaccine treatment was rapid, and in almost all of them an apparently complete cure had taken place. The injections were not controlled by estimation of the opsonic index. The second group consisted of thirteen patients who were treated with stock vaccine. In spite of the fact that none of these patients received any dental treatment the results were very encouraging, although not sufficiently conclusive to justify the writer in formulating an opinion as to the limitations and possibilities of stock vaccines. The improvement in the general health of many of the patients was remarkable.

Thomas Guthrie.

Lautmann, Dr. (Paris).—Anæsthesia during Removal of Adenoids.
 "Zeitsch. f. Laryngol., Rhinol., etc.," Bd. iii, Heft 4.

Up to the age of four years children can be so firmly held that "adenoids" may be removed without narcosis. After this age the operation may have to be repeated if performed without an anæsthetic. The objections to anæsthesia are (1) loss of time; (2) danger. As a matter of fact the assistants in large clinics get accustomed to operate without anæsthesia, and object to use it. Lautmann says that most cases of hæmorrhage occur when the operation has been performed without narcosis. Ruprecht has recommended local anæsthesia, and Lautmann has tried the effect of painting with 20 per cent. alypin; he operates fifteen minutes after the application. Symptoms of poisoning were present in several of his cases. Lautmann is pleased with ethyl chloride anæsthesia administered in the apparatus of Camus.

J. S. Fraser.

LARYNX.

Fetterolf and Norris (Philadelphia).—The Anatomical Explanation of the Paralysis of the Left Recurrent Laryngeal Nerve found in certain cases of Mitral Stenosis. "Amer. Journ. Med. Sci.," May, 1911.

During the past thirteen years thirty-seven cases have been reported in which paralysis of the left recurrent laryngeal nerve was associated with mitral stenosis. The writers have analysed all these cases, and have carefully examined sections and dissections of hardened thoraces with a view to determining the cause of the association. In their opinion the two factors producing pressure on the nerve are increase in size of the surrounding structures, and alteration of position, both dependent on narrowing of the mitral orifice.

The obstruction to the blood-current results first in a dilatation of the left auricle and its appendix. Rise of pressure in this chamber is followed by the same condition in the pulmonary veins, and this in time dams back the blood in the lungs and tends to cause its stagnation in the pulmonary artery and right heart. In consequence there is always present a dilatation of the left auricle and of the pulmonary arteries and veins, which gives rise to a crowding of the mediastinal structures at the base

of the heart. Changes in position are due mainly to distension of the left auricle. The nerve is squeezed between the left pulmonary artery on the one hand and the aortic arch or ligamentum arteriosum on the other.

Reports of cases in which paralysis of the left recurrent laryngeal nerve is attributed to auricular pressure in the course of mitral stenosis should be accepted with much caution, especially in the absence of a *post-mortem* examination.

Thomas Guthrie.

Flatau, Theodor S. (Berlin).—Surgical and Functional Treatment of Vocal Nodules, with Special Reference to the Question of Occupational Injury (Berufsschädigung). "Zeitsch. f. Laryngol., Rhinol., etc.," Bd. iii, Heft 4.

Small symmetrical nodules may be present in singers—especially in sopranos—without functional disturbances; in fact, these nodules probably serve a useful purpose. If these patients get a laryngeal catarrh which does not quickly pass off, the nodules become larger. After voice-rest, etc., the nodules usually return to their normal size. In such cases, the result of interference—by means of forceps, or the cautery—is not favourable. If a nodule causes functional disturbance it is usually unilateral, and is really a small cyst or polypus; such cases should be treated surgically. It is, however, not uncommon to find that, after surgical interference, the singing-voice is still unsatisfactory, though the speaking-voice may have improved, and the cords may present normal appearances on laryngoscopy. Endoscopy, however, shows a concavity on the cord opposite to that from which the nodule was removed. Vocal gymnastic training brings about a cure in a few weeks. In cases in which there is a broad-based projection from the edge of the vocal cord Flatau used a special chronic acid carrier.

J. S. Fraser.

E A R.

Shearer, D. F.—A Method of Determining the Existence of Deafness. "Lancet," May 13, 1911, p. 1305.

The author suggests the use of a noise-producer. When applied to the ears of a patient reading aloud, the voice is raised automatically. The apparatus is controlled electrically, so that the sound made can be gradually increased in volume.

MacLeod Yearsley.

Harper, Jas.—Diffuse Latent Labyrinthitis: Its Dangers in the Radical Mastoid Operation. "Lancet," February 18, 1911, p. 439.

The author draws attention to the grave danger of operating on the mastoid before having tested the condition of the labyrinth. The caloric test should be applied to all cases.

MacLeod Yearsley.

Kerrison, Philip D.—Clinical Studies of Five Cases of Suppurative Labyrinthitis. "Laryngoscope," March, 1911, p. 161.

The first case, a nurse, aged twenty-one, developed acute otitis media and mastoiditis during an attack of hemorrhagic measles. The right mastoid antrum and cells were opened, and five days later the patient developed vertigo and vomiting with rotatory nystagmus to the left. The mastoid cavity was eurented six weeks later for persistent discharge, and the nystagmus and vertigo then ceased. Testing ten weeks after the

onset of labyrinth symptoms, complete deafness with absence of caloric reaction was found on the right side. A double labyrinthotomy was performed, a fistula being found into the external canal.

The second case, a girl, aged fourteen, had had a right radical mastoid operation six months previously. The discharge persisted, and she was now bed-ridden, with much muscular weakness, slight vertigo, but no nystagmus. There was marked inco-ordination of the arms with severe headache and vomiting. Total deafness on the right side with absent caloric reaction. Double labyrinthotomy was performed with complete recovery.

The third case, was a man, aged sixty, with chronic suppurative otitis of the right ear since childhood, with complete deafness and absence of caloric reaction on that side. A radical mastoid operation was performed, and the patient died suddenly six months later, the autopsy showing suppuration in the labyrinth with a cerebellar abscess and meningitis.

The fourth case, a male, aged thirty-six, had a discharge from the left ear since childhood. Symptoms suggestive of labyrinthitis had been present twelve years previously. The left ear was now totally deaf. A radical mastoid and labyrinth operation showed pus in the labyrinth.

The fifth case, a female, aged thirty-five, had suffered from chronic suppurative otitis on the left side for years. There was now fair hearing with normal caloric reaction on the diseased side, with a marked fistula symptom, compression of the air in the meatus inducing horizontal nystagmus to the left.

The author concludes that:

(1) Labyrinth operations are most safely performed when the condition has become latent, and therefore one should wait for a few days or a week when acute labyrinth symptoms are present to allow them to subside before operating.

(2) It is unnecessary to open each canal if the vestibule and cochlea are freely drained.

(3) A radical mastoid operation should always include a labyrinthotomy in cases showing evidence of a previous labyrinthitis.

(4) It is probably unwise to do a radical mastoid operation where a labyrinth fistula is present from the risk of causing extension of the infection.

John Wright.

Nuernberg, F.—Spontaneous Erosion and Rupture of the Internal Carotid after Ligature of the Internal Jugular. "Arch. f. Ohrenheilk," B1. lxxxi Heft 3 and 4, p. 200.

The patient was a male, aged fifteen. Acute suppuration of the left middle ear was followed by mastoid symptoms necessitating operation. The wall of the sinus groove was found to be carious and about 2 cm. of the sinus was exposed. Some days later the existence of an oscillating temperature led the author to open up the sinus and to ligature the internal jugular vein. Seven days after, the ligature round the vein came away. The wound in the neck was granulating well, although at first some tendency to ulceration had been present. The fever persisted, however, with occasional rigors, and an abscess formed in the right gluteal region. After it had been opened and drained diarrhoea set in, but was checked by the administration of opium. Seventeen days after the ligature of the vein the author noticed that some blood was oozing from the wound in the neck. On closer inspection it was seen to consist

of a thin stream of arterial blood, apparently from a small vessel. In order to seize the bleeding point with forceps the edges of the wound were drawn apart, and then it became evident that the bleeding was from the carotid artery. The patient was hurriedly anesthetised while the bleeding was controlled by digital pressure, and the artery was ligatured 3 cm. below the site of the jugular ligature and of the erosion into the artery. The tissues in the depths of the original wound were so necrotic that it was deemed impossible to attempt to tie the artery above the bleeding point. The tying of the artery was not followed by vertigo, paralysis, headache, or any disturbance save hoarseness, which unilateral paralysis of the crico-arytenoideus posticus showed to be due to injury of the recurrent laryngeal nerve. With this exception recovery was proceeding satisfactorily.

The author is confident that the rupture of the arterial wall was due to infective arteritis, and not to any mechanical injury inflicted when the jugular vein was tied.

The accident appears to be unique.

Don McKenzie.

Tiefenthal, G. (Freiburg).—The Technique of Operations on the Jugular Bulb. "Arch. f. Ohrenheilk.," Bd. lxxx, Heft 3 and 4, p. 198.

There are two routes of access to the jugular bulb: the one, represented by Grunert's operation and its modifications, from below and from the side, and the other, represented by Voss's operation, along the lateral sinus groove from above.

Grunert's Method.—The mastoid having been opened and the sinus exposed, the post-auricular incision is enlarged downwards. The inferior and anterior walls of the bony meatus are freed from soft parts and the membranous meatus raised off the bone. In this way the osseous meatus is cleared up to the fissure of Glaser, and it is removed as far as the hypo-tympanic recess, the styloid process being resected if it is in the way. This removal of bone in the anterior and inferior walls of the meatus leads direct to the external wall of the jugular foramen, and that in turn is broken down. In this way the junction of the bulb and the jugular vein is laid bare. The sinus is opened above and the jugular vein and bulb are slit up below, the facial nerve being contained in the bridge of bone between the two openings.

By this plan of Grunert's the bulb and vein are converted into an open gutter, and it possesses the advantage of easy after-treatment. But it is open to several objections, to some of which Grunert himself has drawn attention, and to meet which several modifications have been devised. It is a long operation. The facial nerve is endangered if the styloid process has to be resected, and it may also be torn or stretched in the retraction of soft parts. In order to obviate this difficulty Pause and others advocate the exposure of the nerve in the Fallopiian canal and its removal therefrom, but, in addition to the difficulty of accomplishing this delicate manoeuvre successfully, such a proceeding leaves the nerve-trunk without any protection during the healing of the wound. Further, the jugular bulb not infrequently does not lie in the axis of the external meatus, and then there is a risk of the operator penetrating the carotid canal by mistake. Moreover, in all operations in this region the important nerves in the immediate vicinity of the jugular vein are exposed to injury; the spinal accessory, for example, has been divided in slitting the vein. In order to get more room the anterior tubercle of the trans-

verse process has been removed, and on several occasions the vertebral artery has been wounded in so doing.

None of these drawbacks exist in *Voss's operation from above*. In this method the lateral sinus groove is followed downwards and inwards, first along its vertical and then along its horizontal limb, the bony wall being shaved away by the chisel. That part of the groove where the sinus turns up to pass into the jugular bulb is in like manner removed, the chisel being held at an acute angle to the bone, so as to avoid the Fallopian canal. The sharp edge of bone which intervenes between the sinus groove and the bulb having been got rid of, the bulb is now exposed and can be opened up. In Voss's operation the external wall of the jugular foramen below the bulb is not removed, and that length of the vein which lies between the wound in the neck below and the opening in the bulb above is not, as in Grunert's operation, converted into an open gutter.

Voss's operation is easier, safer, and quicker than Grunert's, and the facial nerve is not endangered. There is, however, some risk of opening into the posterior semi-circular canal in removing the bone near the bulb. For most cases Voss's operation will be found sufficient. The intact length of the vein can be curetted from below, and it acts as a drainage-tube to the bulb. Voss's method has this further advantage, that in a case of doubt it permits of an examination of the bulb without exposing the patient to the risks of a severe operation, such as Grunert's. It occasionally happens, however, that Voss's simple opening of the bulb is insufficient. This is especially the case when thrombosis in the jugular bulb and vein have led to circumvenous infiltration. If that complication is present Voss's operation must be followed by a method like Grunert's.

Voss's operation is most difficult of accomplishment when the sinus and dura are equally covered with granulations, so that it is difficult to follow the sinus.

The author narrates several cases exemplifying the various points in his argument.

Dan McKenzie.

Alexander, G. — Contribution to the Surgery of the Labyrinth. "Arch. f. Ohrenheilk.," Bd. lxxxi, Heft. 3 and 4, p. 209.

Four cases of operation on the labyrinth are reported as illustrating the author's views on the indications for operation.¹

CASE I.—Female, aged twenty-five. Chronic suppuration in both ears of many years' duration. History of violent vertigo and vomiting seven weeks previous to her first appearance. While always subject to headache, this had recently got much worse. There was fetid discharge from the right ear, which had diminished considerably a few days earlier. In the left ear the discharge had been very trifling for several years. There was great loss of hearing in the right ear, and the vestibular reactions were absent on this side. Disturbances of equilibrium were observed, but no vertigo was complained of. The temperature was raised, and slight stiffness and pain were experienced on bending the head back. These symptoms, together with persistent occipital headache and fever, induced the author to perform the radical mastoid and the labyrinth operation at one sitting. Although the fistula symptom had not been positive, a fistula was found on the prominence of the external canal. From the superior canal a sinus led upwards towards the middle fossa; the bone around was softened, and

¹ See JOURN. OF LARYNGOL., RHINOL., AND OTOL., vol. xxv, p. 151.

the dura in the neighbourhood was covered with granulations. The dura in the posterior fossa was incised. Recovery.

CASE 2.—Girl, aged eighteen. Chronic suppuration in right ear. Attacks of headache and vertigo and the history of occasional attacks of loss of consciousness led to the radical mastoid operation. The vestibular reactions were normal. Six weeks after operation symptoms of acute labyrinth suppuration (vertigo, spontaneous nystagmus, absolute deafness) appeared, but quickly subsided, although they did not entirely disappear. Granulations formed on the inner tympanic wall, the discharge became fetid, and small sequestra were exfoliated from the region of the promontory. Vestibular reactions were now found to be absent on right side. The persistent vertigo and discharge showed that spontaneous recovery was not to be expected, and the labyrinth was, therefore, operated upon after the author's method. The dura of the posterior fossa was incised for drainage. Recovery.

CASE 3.—Male, aged twenty-one. Chronic suppuration of left ear with recent acute exacerbation. Deafness not severe. Some disturbance of equilibrium was present, but the vestibular reactions were not destroyed. Fistula symptom positive. Radical mastoid revealed dura of middle fossa covered with granulations. No fistula of labyrinth found. Three weeks after radical mastoid operation the patient had an attack of severe headache with vertigo and abdominal pain. These symptoms lasted only a few hours, but a fortnight later marked spontaneous nystagmus to the right was observed and the vestibular reactions were found to be absent. Operation on the labyrinth was postponed in the hope that the disease would settle down, but the persistence of active symptoms ultimately led to operation two months after the radical mastoid had been performed. The dura of the posterior fossa was incised for drainage. Recovery.

CASE 4.—Female, aged thirteen. Chronic suppuration in both ears for many years. Facial paresis had appeared on the right side a fortnight before she was first seen. This was followed a week later by an attack of vertigo and vomiting of only one day's duration. Spontaneous nystagmus to the left was observed, but there was no disturbance of equilibrium. The caloric reaction was absent in the left side, but both galvanic and rotation nystagmus could be elicited. Fistula symptom negative. Operation five days after admission, the labyrinth being opened because of the facial paresis and the presence of softened bone in the region of the promontory. The cochlea was filled with granulations. A fistula 3 mm. long led into the external canal.

The author does not operate on the labyrinth unless evidence of some complication is present, as a large proportion of cases of labyrinth suppuration get well naturally. In addition to the usual signs of labyrinth disease, then, occipital headache, stiffness in the muscles of the neck, facial paralysis, persistent vertigo or pyrexia, the discovery at the mastoid operation of serious disease of the bony capsule of the labyrinth—not merely the presence of a fistula—should be present before the labyrinth is opened. If those signs exist before the mastoid operation, the labyrinth should be dealt with at the same time as the mastoid.

The deceptive character of the "fistula symptom" is well brought out in the above cases.

Don McKenzie.

Sewell, Lindley.—A Case of Deafness Arising from Epidemic Parotitis. "Lancet," February 18, 1911, p. 436.

Female, aged thirty-six, who had become deaf during an attack of mumps three months previously. Functional tests showed nerve-deaf-

ness on the right side. She was unsteady in her gait, stumbling to the right. No nystagmus. Strychnine and quinine improved the vertigo.

MacLeod Yearsley.

THYROID GLAND.

Burt, R. Shurley.—**Manifestations of Thyroid Disease in the Upper Respiratory Tract.** "Laryngoscope," March, 1911, p. 145.

A large number of patients, the subject of thyroid disease, refer their first symptoms to the throat. The faucial tonsils appear to be in physiological and pathological relationship to the thyroid gland. It has been noted that thyroid enlargement has subsided after enucleation of the tonsils, and also that septic processes involving the lymphoid tissues, *i. e.* tonsillitis, quinsy or scarlet fever, are often direct aetiological factors in the occurrence of Graves's disease. It is therefore possible that tonsillectomy may have a place in the prophylaxis of Graves's disease. In cases of hypothyroidism, slowness and difficulty in articulation are often present. Slight motor insufficiency of the laryngeal muscles also occurs, but the affection of speech is not proportionate to this paresis. A perversion of taste is also often present. Two myxoedematous cases complained of tinnitus, but no lesion could be found on aural examination to account for this. In hyperthyroidism, or Graves's disease, taste, hearing and smell are less commonly affected. Cases of myxoedema sometimes present a peculiar infiltration of the nasal mucosa as an early sign, and later the membrane is found much thickened and the nose obstructed by a gelatinous yellow secretion. A cough with dry throat and husky voice may be the initial symptoms of Graves's disease, and cause the patient to first consult the laryngologist.

John Wright.

Bahri, Ismet (Constantinople).—**A Case of Acute Suppurative Thyroiditis after Influenza.** "Rev. Hebd. de Laryngol., d'Otol., et de Rhinol.," February 4, 1911.

A man, aged forty-two, who was just recovering from an attack of influenza, observed a swelling of the front of his neck, which became painful, gradually increased in size, and finally pointed. There was pain in deglutition and respiratory distress, owing to oedema of the ary-epiglottic folds and ventricular bands. After evacuation the symptoms subsided, but the thyroid remained swollen. The pus contained streptococci.

Chicade Nourse.

MISCELLANEOUS.

Coakley, C. G. (New York).—**The Association of Suppurative Disease of the Nasal Accessory Sinuses and Acute Otitis Media in Adults.** "Amer. Journ. Med. Sci.," February, 1911.

The subject is dealt with in two portions, namely, (1) statistics and (2) personal impressions. The former are based on a series of cases observed during a period of six months, consisting of sixteen cases of acute suppurative otitis media; twenty-six cases of acute rhinitis without sinus involvement; thirty-one cases of acute sinusitis (all of which also had acute rhinitis), and thirty-six cases of chronic sinusitis. Of the cases of acute otitis media 81 per cent. suffered also from sinus disease; of the cases of acute rhinitis 14.5 per cent. had acute suppurative otitis media; of the cases of acute sinusitis 42 per cent. had acute suppurative otitis

media; and of the cases of chronic sinusitis 3 per cent. had acute suppurative otitis media.

It is the author's conviction that the early recognition of sinus disease and appropriate treatment for its relief, will prevent many a patient from developing acute otitis media. It is significant in this connection that the acute otitis media usually occurs on the same side as the sinus disease; moreover, cases of acute otitis media associated with nasal accessory sinus disease are more likely to develop disease requiring a mastoid operation than those not complicated by sinus trouble. The author has repeatedly seen cases of severe otitis media and mastoiditis, with all the indications for mastoid operation, recover without a mastoid operation when the nasal sinus disease was recognised and treated. Cases of chronic suppuration of accessory sinuses are much less liable to acute otitis media than those with acute sinus disease. This is probably due both to decreased virulence of the pathogenic organisms and to the formation of anti-bodies by the host.

Thomas Guthrie.

Williams, Washington.—The Pathology of the Cranial Nerves in Tabes Dorsalis. "Amer. Jour. Med. Sci.," March, 1910.

This paper refers chiefly to the oculo-motor paralysis so frequently met with in tabes, but in conjunction with preceding articles (*Amer. Journ. Med. Sci.*, August, 1908, and *Medical Record*, January 29, 1910), it deals fully with the ætiology and microscopic appearances of the cranial nerve palsies occurring in tabetics, both during the early stages and after the disability has become permanent. The writer supports the views of Babinski and Nageotte that all the symptoms of tabo-paresis ensue upon a chronic meningitis of syphilitic nature. The fundamental lesion of tabes dorsalis is, in fact, a chronic syphilitic arachnoiditis. The result of this is a transverse radicular neuritis causing more or less complete damage to the nerve. If the process is arrested before it has proceeded too far a considerable degree of recovery may take place, partly as a result of the regeneration of the nerve. In the author's case, which is fully reported, there was complete paralysis of all acts governed by the third nerve with the exception of the pupillary reaction upon accommodation. The nerve was examined *post-mortem* and a distinct focus of transverse radicular neuritis was found at a point 4 mm. after entering the paretic of the cavernous sinus. The portion of the nerve affected measured only 1.5 mm. in length and was situated immediately behind the place where the nerve is divided into compartments by the layer of connective tissue which accompanies its anastomotic branches. Islands of regeneration were present both above and below the site of the lesion. In addition to the oculo-motor paralysis there was complete blindness, the right vocal cord was paralysed, and the right side of the tongue was atrophied, corrugated, and showed fibrillary twitchings. The optic nerve presented characteristic tabetic atrophy, and the hypoglossal showed changes similar to those of the third nerve. The nuclei of none of the cranial nerves showed any alteration, although carefully studied in serial sections.

Thomas Guthrie.

Brown, W. Langdon.—An Inquiry into the Value of Rectal Feeding. "Proc. Roy. Soc. Med.," April, 1911 (Therapeutical Section).

The results obtained by giving isotonic saline solutions by the bowel are just as good as those got by so-called "nutrient enemata." Rectal feeding is apt to cause secretion of gastric juice.

J. S. Fraser.

Strong, L. W.—**The Preparation and Use of Thrombo-kinase.** "Laryngoscope," February, 1911, p. 81.

This is a dry powder prepared by the precipitation of a saline tissue extract (in this case from lung) with acetic acid. It, if applied locally, promotes clotting, and hence arrest of hæmorrhage. The author states that it has been used successfully in bleeding from the tonsil, but details are not given. Its action is probably due to the presence of a ferment.

John Wright.

OBITUARY NOTICE.

T. G. OUSTON, F.R.C.S.Eng.,

Surgeon, Throat, Nose, and Ear Hospital, and Hospital for Sick Children,
Newcastle-on-Tyne.

WE regret to announce the death, on August 1, of Mr. T. G. Ouston, widely known as one of the most prominent north-country representatives of our speciality.

Mr. Ouston, having passed through his medical curriculum at Guy's Hospital and at the Yorkshire College, Leeds, acquired in 1891 the diplomas of L.R.C.P. and M.R.C.S. In 1894 he became a Fellow of the Royal College of Surgeons, England, and in the following year began his career in Newcastle-on-Tyne as a general practitioner. After having accumulated much valuable experience in general medicine he began to direct his activities to diseases of the throat, nose, and ear, and, at the time of his demise, occupied the post of surgeon to the Newcastle Throat and Ear Hospital, and had built up a considerable private practice as a specialist.

Mr. Ouston was a familiar figure at the meetings of the Newcastle Medical Society, where his work and opinions were highly appreciated by all his fellow members. The last weeks of his life were occupied in the preparation of a paper dealing with the action of radium in the treatment of lupus and other diseases of the nose and throat. This paper he had intended to read at the recent meeting of the British Medical Association at Birmingham, but the intervention of the illness that was destined to end his life prevented his intentions being carried into effect. And it has been reserved to the JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOLOGY to publish in the present issue this last effort of his scientific energy.

Mr. Ouston died at the too early age of forty-two years, only six months after his marriage, and at the zenith of a career full of success, usefulness, and popularity.

BOOK RECEIVED.

Handbuch der Speciellen Chirurgie des Ohres und der oberen Luftwege.

Herausgegeben von Dr. L. Katz, Dr. H. Freysing, und Dr. F. Blumenfeld. Bd. iii, Lieferung 1 and 2. Würzburg: Curt Kabitsch (A. Stuber's Verlag), 1911.

THE JOURNAL OF LARYNGOLOGY, RHINOLOGY AND OTOTOLOGY.

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DISCUSSION ON THE TREATMENT OF TUBERCULOSIS OF THE LARYNX.

OPENING PAPERS.

I.—DUNDAS GRANT, M.A., M.D., F.R.C.S.

My able collaborator having undertaken in his review of the subject to include consideration of general treatment as well as local treatment, I shall occupy the time allowed me in discussing certain factors in laryngeal tuberculosis which, in my experience, are of practical importance in relation to its treatment.

TREATMENT IN RELATION TO CERTAIN ÆTIOLOGICAL FACTORS.

Whatever views may be held as to the determining causes of the localisation of tuberculosis in the larynx, there can be no doubt that local irritation is a very important factor, and the causes of irritation may be physiological, mechanical, pathological—that is to say, may be associated with function, physical irritation or traumatism, and pathological changes in the neighbouring regions. We shall, therefore, have to keep before our minds the use or abuse of the voice in speech and cough, the inhalation of irritants, deglutition of hard, imperfectly masticated food, etc.

In regard to the *use or abuse of the larynx for vocal purposes*, those who have not witnessed it will scarcely believe the extra-

ordinary improvement in the voice and in the condition of the vocal cords in laryngeal tubercenosis after the maintenance of silence for three or four weeks. For this the patient must be conscientious and enter into the spirit of his fight against his disease, and in no disease is he more ready to do so than in the one we are considering, especially if inspired with hope and courage by a decided and sympathetic adviser. Whispering is better than nothing, and may be practised under observation after the speaking voice, on trial, is found good. It must, however, be a genuine *voiceless* whisper, and not the subdued jerky grunt which is sometimes used in its stead. A lady patient, under the care of Mr. Noble Bruce and myself carried out this "silence cure" conscientiously for a number of months, and only at the end of that time did she allow herself to speak in an ordinary voice, of which she had almost lost the habit. The clearness of the sound was then a startling revelation, and the laryngoscope showed that the previous infiltration with superficial ulceration, both in the cords and interarytenoid tissue, had practically disappeared. It has now subsided entirely.

Cough is even more irritating to the larynx than phonation, and though a "useful" cough is inevitably to be permitted, many of the coughs indulged in by our patients are both useless and injurious. They are, fortunately, to a certain extent to be controlled by an effort of will, and the exercise of this effort is of more value than drugs; wherefore the patient should be drilled in its exercise. When the larynx is involved the cough spots are doubly excitable. Some patients preface every utterance by the emission of an aggressive and unnecessary "hem," which must be authoritatively proscribed. It will probably be agreed that heroin is the remedy *par excellence* to quiet the cough centre, and for "useless" coughs is probably indispensable. Codeia and compound tincture of camphor seem to quiet them in many cases without locking up the expectoration. What I have said with regard to the whisper is equally true of the cough—that is to say, that there is a "voiceless" cough, practised without closure of the vocal cords or ventricular bands. This, although not supplying that temporary resistant occlusion which is necessary for the production of full-bodied explosive expectoration, is still sufficient for the ejection of a considerable amount of secretion at very much less expense in the way of irritation of the larynx. The acquisition of this voiceless cough is worthy of the patient's attention.

The form of treatment known as "continuous antiseptic inhalation," and ardently advocated by Dr. Burney Yeo (1) and Dr. David Lees (2), has found considerable favour at the hands of my colleagues. I have seen every reason to be gratified with its effect, although I am not thoroughly convinced as to its mode of action so far as its destructive power over bacilli is concerned. I thoroughly believe that it is by checking the cough that it is beneficial, and when it does not check the cough I doubt whether it does much good. The formula should, therefore, be modified according to its effect in this respect in the individual patient. It has the subsidiary effect of deterring the patient from indulging unduly in conversation, thereby affording additional rest to the larynx. Burney Yeo's perforated zinc respirator, or some modification of it, is the form most in vogue. Dr. Beverley Robinson (3), of New York, was one of the first and most strenuous advocates of this form of continuous inhalation, and his records of cases are both instructive and encouraging. The main ingredient in the drops with which the wool in the respirator is moistened is creasote, variously combined. Menthol (which as a French writer has sarcastically stated "enters into all the sauces") is an almost invariable component, but it must be kept within such limits as not to irritate and excite cough. It is perhaps best reserved for applications to the larynx in oily solution.

A useful and pleasant formula is: creasote, ʒiij; ol. pin. sylvest., spir. chlorof., āā ʒjss; ol. cinnamon., ol. citronell., āā, ʒ v. A little menthol, say 5 gr., gradually increased, may be added unless found irritating.

Air which has not been warmed and filtered by the nose is another irritant, and in patients who are not in too advanced a stage, the removal of nasal obstructions, especially the submucous rectification of deflected septums, has repeatedly led to improvement. Dr. Bucklin (4), of New York, considers the removal of nasal obstruction sufficient to determine a cure in many cases of pulmonary tuberculosis. This is, in my opinion, an exaggeration of a truth of which I have seen many proofs. One most important irritant is the secretion from the nose and naso-pharynx when these cavities are the seats of catarrh or suppuration on their own account, or from the propulsion into them of excreta from the diseased lungs.

It was to me a surprising discovery during my earlier days at Brompton Hospital, on inquiring of patients whose improvement had especially struck me, to find that they dated their improve-

ment from the time when they were ordered to use a wash for the nose. This point deserves to be most carefully noted by those who have not yet had it forced on their observation.

For this purpose any simple alkaline and antiseptic lotion of isotonic specific gravity may be employed, but the following has been found very useful for routine purposes:

Sod. biborat	96 gr.
Sod. chloridi	48 „
Sod. salicylat.	48 „
Glyc. pur	72 m

Aq. menthol (made like aq. camph.) to 6 oz. (a teaspoonful in about 1 oz. of warm water.)

Dr. Clegg informs me that this lotion would be more accurately



FIG. 1.—The inspiratory nasal douche.

isotonic if the amount of biborate of soda was reduced to 24 gr., and that of the chloride of sodium increased to 84 gr.

It may be employed by means of my "inspiratory" nasal douche, of which the one shown in the figure was the original model, but which can be very simply replaced by means of a short glass tube with a flattened bulb at one end to fit comfortably into the nostril, the other end touching the bottom of wine-glass or egg-cup into which the solution is poured. The patient can then (in the absence of contra-indications) draw the fluid through the nose by means of a snuffing action, with or without closure of the opposite naris, the liquid getting into the pharynx, from which it is then hawked out. The Woakes's nasal douche, or any of its congeners, may also be employed.

The inhalation of tobacco smoke, dusty air, or irritating vapours must be strictly prohibited.

TREATMENT IN RELATION TO CERTAIN LOCAL CONDITIONS.

In many cases, of course, the local infiltration is so considerable or so progressive that spontaneous absorption is not to be expected. Until recently the resources at our disposal were practically non-existent, and we were driven to a policy of masterly inactivity, for which, fortunately, we have substitutes whose efficiency is founded on scientific principles as well as evidenced by experience. I recently questioned a pathologist as to the nature of the change in the healing of tuberculous lesions. He replied that he could answer me in one word—"fibrosis." The local measure likely to bring this about is an irritant which will set up an inflammatory change in the tissue, and cease its further irritant action as soon as it is removed. Such is the galvano-caustic puncture effected by means of a fine platinum point introduced deeply into the tissue. The result is an active cauterisation of the deeper parts producing a zone of fibrosis with the minimum of destruction of the surface epithelium. Its use was strongly advocated by Mermod (5) and Grünwald (6), and its value was confirmed by the extensive trials given to it by Siebenmann (7).

In the earlier years of the Laryngological Society I showed a case of a tuberculous ulcer of the vocal cord to which I had made an application of the galvano-cautery point so limited that the sloughy patch produced by the traumatism was taken for pachydermia by several examiners. The ulcer healed, and eventually the patient recovered his health so thoroughly as to go through an active career in the Bechuanaland Police. I did not realise the full value of the agent I was employing, but during the last three years I have been using it constantly, and have shown numerous cases illustrating its beneficial effect. In fact, when I inquired of the sister in charge of the throat department at Brompton Hospital which cases derived the most benefit from the treatment there, she unhesitatingly replied that it was those for whom I had used the galvano-cautery. I at first feared it would be followed by pain and by inflammatory oedema, but to my surprise I found almost immediate diminution, or even elimination, of pain and practical absence of oedema. In these respects there was a marked contrast to what we had often seen after the active use of lactic acid. The traumatic irritation seems to cease to extend when the cautery point is removed, whereas it is not so limited in the case of chemical caustics injected into the part. The galvano-caustic puncture produces in about a week a diminution in the infiltrative swelling

and the formation of a dimple at the point of puncture. Several points may be punctured at the same sitting, as, for instance, the two aryepiglottic folds and each half of the epiglottis. It may be repeated in a fortnight if desired, but I do not do it sooner.

A sufficient degree of anaesthesia of the larynx for galvanocautery puncture is generally secured by the use of five drops of a 20 per cent. solution of cocaine, to which a small proportion of adrenalin has been added. By means of a glass or other intra-laryngeal syringe the solution is allowed to drop on to the laryngeal surface of the epiglottis, and from there to diffuse itself over the inner aspect of the larynx. A drop may also trickle over the laryngeal surface of the epiglottis, and the fauces may be painted once or twice with a 10 per cent. solution. This syringing is facilitated by the previous insufflation of a small amount of anaesthetic. In the case of exceptionally sensitive patients it is advisable or even necessary to give a general sedative such as a hypodermic injection of $\frac{1}{8}$ gr. of morphine and $\frac{1}{100}$ gr. of atropine three-quarters of an hour before the cauterisation. The same method of anaesthetisation is applicable in the case of other intra-laryngeal operations.

With regard to the galvanocautery points I find it preferable to have the copper supports side by side instead of one above the other in order that the alteration of the curve may be easily effected according to the situation of the part to be cauterised. I usually thin the point by means of a fine file; this renders the operation easier, though of course it shortens the life of the platinum point.

Circumscribed tuberculomata may project from any portion of the larynx, but most frequently from the ventricles and from the interarytanoid region. In the latter position they are often, however, really the upper margins of ulcers extending down the posterior wall. Such projections may be removed with forceps or curettes, and I have in several cases been able by their means to relieve the obstructive dyspnoea and to obviate the necessity for tracheotomy. It is often possible to reduce them by repeated galvanocautic punctures.

Painful ulceration of a limited area of the epiglottis or the aryepiglottic fold may justify removal of the portion by means of punch forceps, such as Gouguenheim's, Schmidt's, or Lake's, and the beneficial results as regards pain have been instantaneous. The more extended use of the galvanocautery has rendered these operations in many cases unnecessary and less frequent than

formerly. In a recent publication trichloroacetic acid has been advocated as an application to tuberculous ulcers and vegetations in the larynx. In the few cases in which I have since tried it it seemed to justify the writer's favourable opinion. When ulceration has taken place we have to destroy the tubercle bacillus and at the same time combat the other micro-organisms which implant themselves in the ulcerated tissues. Here lactic acid has a place, although in the past too much has been expected of it. It may be applied by means of a wool swab in gradually increasing strength from 50 per cent. upwards. Lake has combined it with formalin and carbolic acid—namely, formalin 7 parts, carbolic acid 20, lactic acid 50, water up to 100. The larynx should be previously cocaineised, and the application should be as carefully limited to the ulcerated area as is possible. It is advisable to cleanse the parts beforehand with a 1 per cent. solution of bicarbonate of soda by means of a laryngeal syringe or spray.

Antiseptic powders may be insufflated by means of a powder blower, or inhaled by Leduc's tube, to which I shall again refer. Among such powders may be mentioned iodoform, di-iodoform, resorcin, nrotropin, and others. I shall give some formulæ for these when considering the symptom of pain. Iodoform may be applied by means of a spray of a saturated solution in ether. The insertion of the galvano-cautery point through the floor of the ulcer into the infiltrated tissue on which it is formed assists in inducing healing.

TREATMENT IN RELATION TO CERTAIN SYMPTOMS.

Certain symptoms are, as such, so important as to call for special consideration.

When ulceration takes place on the walls of the larynx (epiglottis, aryepiglottic folds, etc.), the most pronounced symptom is the violent tearing *pain*, especially marked on swallowing. This, indeed, is the characteristic horror of this disease. The treatment of this symptom is naturally that appropriate for the treatment of the ulceration, but special measures are usually required. When I first commenced the study of laryngology our main resources were the application of morphine in glycerine (recommended by Isambert) and the insufflation of morphine in starch (by Morell Mackenzie). The former gave slight, the latter very considerable relief, but probably as a local coating and general narcotic rather than as a local sedative. Later came the discovery of cocaine, and

with this, then, as now, a very grateful local anaesthesia was produced, which was rather slow in induction, quick in subsidence, and possessed of well-known deleterious effects. This was followed by the advent of orthoform, producing local anaesthesia, slowly induced but of considerable duration. It acted, however, only on the ulcer and not on the unbroken surface. This is a minor inconvenience in the disease we are considering, and any injurious effects are extremely rare. I believe it has a tendency to diminish the oedematous swelling of the part. Anaesthetin has the advantage of producing a mild anaesthesia with great rapidity, but the effect is very transitory. It acts, however, on the unbroken mucous

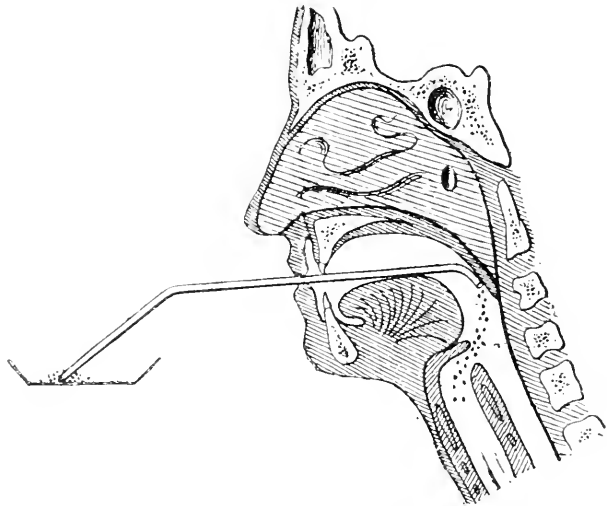


FIG. 2.—Leduc's laryngeal powder inhaler.

membrane, and has antiseptic and decongestionising properties. It may, therefore, be combined with orthoform. These remedies may be applied by means of a powder-blower when convenient, but the patient may introduce them for himself by means of Leduc's tube as before mentioned.

Leduc's tube consists of a tube of glass of about $\frac{1}{4}$ in. in calibre and of about 10 in. in length. At one extremity a small portion of it is curved at an angle of 60 degrees, while at the other the last 3 in. are bent at an angle of about 45 degrees. The diagram will best indicate its shape as well as the mode of using it. The following directions with the diagram attached are given to the patients at Brompton Hospital who have to use it:

Put a small quantity of the powder in a saucer. Place the

curved end of the glass tube in the mouth so as to reach to the back of the throat, the hole at the end of it pointing downwards; close the lips firmly round the tube and dip the long outer bent end in the powder as in the picture. Then draw in your breath quickly as if sucking. The powder ought to pass deeply into the throat.

The following are the formulæ of some useful powders:

1. Anæsthesin and orthoform Equal parts.
2. Resorcin One part.
Orthoform Three parts.
3. Urotropin One part.
Anæsthesin and orthoform, of each Two parts.
Sacch. lact. Three parts.

I may seem to have minimised the value of menthol in inhalation, but I have no doubt of its great usefulness as an intra-laryngeal and intra-tracheal injection. Rosenberg (8) demonstrated its value, and if we do not expect it to be a panacea we shall not be disappointed. I have seen considerable diminution of cough and expectoration follow the injection twice or thrice a week (daily, if possible) of about 20 m of fresh olive oil, containing 10 per cent. of menthol and 1 per cent. of guaiacol, by means of an intra-tracheal syringe (Brommer's is excellent). It will be generally agreed that the subglottic region is one of the most excitable cough zones, and the menthol acts as an excellent sedative to the mucous membrane. Moreover, during the cough which follows the injection, the liquid is driven up into the ventricles of the larynx, as the approximation of the ventricular bands is one of the first movements in the action of coughing, and the ventricles constitute a most favourable nidus for the development of the tubercle bacilli, as well as the other pathogenic organisms which share in the deeper extension of the disease.

In some cases the pain is due, as I have already said, to the presence of an ulcer on some exposed part of the larynx so limited as to be capable of extirpation. Thus the epiglottis in part, or as a whole, may be removed by means of Schmidt's, Lake's or Barwell's pinch forceps, and one or both arytenoid swellings may be pinched away with Gouguenheim's instrument. Instant relief usually follows this proceeding, brutal though it may appear. I have resorted to it less frequently, as I have found it possible to avoid it by the free use of the galvano-cautery, and I have seen reason to believe that the liberal use of the pinch forceps is apt to facilitate the occurrence of regurgitation of liquids into the larynx. This is, however, probably attributable to the fact that in some of

the cases in which I practised it there has been considerable destruction of the rest of the framework of the larynx.

There remains to be described the anaesthetisation of the larynx by the injection of alcohol into the superior laryngeal nerve. This is effected by means of an ordinary vaccine syringe, the Record, provided with a special needle rather coarser than an hypodermic one, and with the point bevelled at a much more obtuse angle. It is thus most unlikely to puncture any blood-vessel. It is also provided with a shoulder at a distance of 1.5 cm. from the point, so that it can be readily recognised when it has penetrated to this depth, as shown in the figure.

The solution that I use is the one recommended by Dr. Purves Stewart for anaesthetisation of the branches of the fifth nerve; it consists of 2 gr. of hydrochloride of eucaine β in an ounce of 80 per cent. alcohol. The method of injection which I practise is the one recommended by Dr. Hoffman in the *Proceedings of the German Laryngological Society for 1909*, and he describes it so



FIG. 3. - Syringe for injection of alcohol into superior laryngeal nerve.

clearly that I cannot do better than reproduce his description in his own words: He "places the patient in a horizontal position, and, with the thumb of the left hand, presses the sound side of the larynx towards the middle line so that the affected half projects distinctly; the other fingers of the hand lie on this. The index finger enters the space between the thyroid cartilage and the hyoid bone from without, until the patient announces that a painful spot has been reached. With a little practice one arrives at it at the first go-off, when one has become familiar with the topographical relations. One now places the nail of the index finger on the skin (which has been previously disinfected) in such a way that the point of entrance for the needle lies opposite its middle. The needle is pushed in for about $1\frac{1}{2}$ cm.; this distance is marked off on the needle perpendicular to the surface of the body. According to the thinness of the subcutaneous layer of fat the perforation has to be more or less deep. The needle is then carefully moved so as to seek a spot at which the patient states that he feels pain in the ear. The syringe, filled with 85 per cent. alcohol warmed to a temperature of 45° C. (113° F.) is screwed on

to the handle, and the piston is then slowly pressed down. The patient now feels pain in the ear, the passing off of which he indicates by raising the hand. During the operation he has to avoid both swallowing and speaking; if, however, he makes a movement of swallowing, we must follow the movement of the syringe with a light touch. The injection is kept up until no further pain occurs in the ear, then the needle is removed and collodion or sticking-plaster is placed on the spot of injection without pressure."

As a rule there is almost immediate relief for a time, owing, no doubt, to the anæsthetic effect of the eucaine, but a more permanent relief due to the action of the alcohol on the nerve is sometimes delayed. I published last year (9) the reports of the first six cases in which I employed this method, in all of which swallowing could be accomplished afterwards without pain. The length of duration of the anæsthesia has varied, and, in some cases, I have repeated the injections at the patient's urgent request, which I take as evidence of the relief which it procured them.

One of the most serious problems, and, so far as I can see at present, an imperfectly solved one, is how to nourish satisfactorily a patient in whom regurgitation of liquids into the larynx during drinking has established itself. The physical conditions producing this are usually such an amount of loss of substance in the interior of the larynx that there is no obstacle to the entrance of liquids—later, also, of more solid aliments—with, at the same time, such rigidity of the framework as the result of infiltration that the impaired sphincter muscles are unable to draw them together to counteract the patency of the tube.

A most ingenious means of meeting this is the method of drinking devised by Wolfenden (10). In this the patient lies on his face on a couch with his head hanging over, and so much inverted that he can drink from what may be called the remote side of the cup. I have found many patients greatly relieved by this, but the change of attitude involves more fatigue than the debilitated patient can always undergo, and the limits of its usefulness are, unfortunately, too soon passed.

My helper, Dr. Kisch, has found that external compression of the larynx by means of the finger and thumb sometimes meets the requirements of the case. Bryson Delavan (11) devised a feeding bottle with a bellows for blowing in air and for forcing the liquid down a feeding tube. The introduction of a feeding tube is, however, most unpleasant to the patient, and in the condition of

the larynx which renders regurgitation unavoidable there is the risk of the tube, especially if at all flexible, entering the larynx and aggravating the situation.

In Wolfenden's method the liquid has to flow over the orifice of the larynx, and *à priori* the tendency for it to enter it ought to be great, although experience shows it to be inconsiderable. I have recently tried the opposite attitude, as suggested to me by Casselberry's (12) method of feeding an intubated child. The patient is laid on his back on a hard couch or the floor with a cushion under his shoulders, so that the head drops back. He then drinks from an ordinary infant feeding-bottle. A patient to whom I gave plain water by this method told me it was "the best drink he had had for months." I recommend this method to favourable consideration.

Theoretically, as a last resource, it might be possible to introduce by means of a tracheotomy wound a tracheal cannula covered with a distensible jacket which could be blown up sufficiently to occlude the trachea and prevent the access of liquids to the bronchi. We know, however, that when there is advanced pulmonary disease, as is almost inevitable at the stage we are discussing, tracheotomy is usually the beginning (to say the least!) of the end. This proceeding was carried out in a case of carcinomatous tracheo-oesophageal fistula by the late Michael of Hamburg, but the circumstances in tuberculous disease are necessarily different. Even the permanent soft rubber oesophageal tube, which is so well borne in many cases of oesophageal cancer, is scarcely tolerable in tuberculosis. It is, however, the most likely of the methods I have mentioned. In practice, unfortunately, regurgitation in most cases means a speedy termination. If I seem to suggest rather violent measures it is in view of the heart-rending spectacle afforded by many of the sufferers in this agonising stage of the disease, but which many are spared from experiencing by the supervention of a desirable euthanasia resulting from their pulmonary or general tuberculosis.

In tuberculosis, as well as in other affections of the larynx, great discomfort, nausea, and even vomiting have been caused by the *accumulation of inspissated secretion* in the lower part of the pharynx. Remarkable relief from these symptoms sometimes follows the daily cleansing away of these collections by the use of a laryngeal syringe with a 1 per cent. solution of sodium bicarbonate. A spray or even a gargle may be used when syringing is impracticable.

MAIN POINTS.

I will conclude by summarising the main points to which I wish to draw attention.

- (1) Rest of the larynx as regards both voice and cough.
- (2) Attention to the condition of the nasal passages.
- (3) The value of the galvano-caustic puncture in extensive and persistent infiltration.
- (4) The use of Ledue's tube for the inhalation of antiseptic and anæsthetic powders.
- (5) The injection of alcohol into the superior laryngeal nerve to produce prolonged anæsthesia.

There are, of course, many others, but it seems to me that those above enumerated have not generally received the full consideration and appreciation to which their efficacy entitles them.

Above all it is necessary to avoid counsels of despair. Many cases, even apart from the early ones, are susceptible of cure, improvement is now quite usual, and even among the worst there are very few in which great relief cannot be procured.

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H.—P. WATSON-WILLIAMS,

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Royal Infirmary: President of the Laryngological Section of
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DURING the past twenty years, to go no further back, the treatment of laryngeal tuberculosis has been the subject for discussion on several occasions in this Section of the British Medical Association, and very many times has this topic occupied the special attention of laryngologists assembled under the auspices of congresses and societies in this and other countries; and yet, though some of us have seen considerable variation in the principles of therapy advocated and practised, the discussions have never brought out a general consensus of opinion in favour of any particular views. Nor is it to be expected that we shall hear to-day the last word on the relief of sufferers from this very frequent complication of pulmonary tuberculosis, inasmuch as one must always assume that the laryngeal disease is secondary, unless it can be demonstrated otherwise by *post-mortem* examination. During the earlier portion of the period I have referred to, the treatment upheld was essentially surgical on the lines for which Krause and Heryng claimed such a high percentage of successful results; yet by 1901 these methods were receiving less support, and when the treatment of laryngeal tuberculosis was discussed in this Section at the Annual Meeting at Cheltenham in that year, I urged that silence was a golden rule in most cases; and in the same year StClair Thomson emphasised the value of silence. In 1905 again this Section discussed the subject, and a prominent part was taken by Jobson Horne, whose painstaking researches in laryngeal tuberculosis have assisted us greatly in developing methods of treatment on a sound pathological basis, and in the recognition of the early manifestations of laryngeal involvement during what was at one time termed the pretuberculous stage.

The occurrence of *primary* laryngeal tuberculous disease is so exceedingly rare that we must always assume that it is a secondary lesion until it is demonstrated by *post-mortem* examination to have been primary, and as that is too late for questions of treatment to arise, we may leave any question of primary laryngeal disease out of consideration to-day.

The subject of our discussion being the treatment of a local infection complicating a systemic tuberculous infection, it follows that the general treatment of tuberculosis is an essential factor

which cannot be ignored. Now the general treatment of tuberculosis is not the subject of our discussion, except in so far as general treatment influences laryngeal lesions. Therefore I shall now refer only in general terms to the two chief methods now in vogue for the treatment of tuberculosis—namely, sanatorium methods and the vaccine treatment by various tuberculins.

Sanatorium Methods of Treatment and the Effects of Altitude and Climate.—To what extent may we rely on "sanatorium treatment" alone in dealing with laryngeal tuberculosis? My experience has left me with a firm conviction that any treatment that improves the general physique and favourably modifies or arrests pulmonary consumption will generally result in a corresponding improvement or cure of a laryngeal complication. One of the essential features of the sanatorium method is rest and strictly regulated exercise, and the resting of the involved larynx by complete abstention from the use of the voice is included in the principles of treatment which we may summarise under the term "sanatorium treatment." It is particularly in tuberculous laryngeal lesions, involving the vocal cords and processes, and the arytaenoid and inter-arytaenoid regions, that prolonged silence is so valuable, and in the great majority of cases these are just the regions most affected. Without any local application or treatment whatever and without the administration of any form of tuberculin I have repeatedly seen ulcers on the vocal cords and processes heal up, interarytaenoid swelling and ulceration disappear, arytaenoid regions swollen with tuberculous infiltration resume their normal contour and aspect, and, with the pulmonary lesions healed, the voice has re-acquired its natural strength and quality. For instance, a medical friend, in whom nearly the whole of the upper lobe of one lung, as well as the vocal cord and corresponding arytaenoid region, were tuberculous, and with tubercle bacilli in the sputum, recovered completely and has remained cured for over eight years. In another case a clergyman with a tuberculous right upper lobe, with tuberculous sputum, and laryngeal tuberculosis involving both vocal processes and interarytaenoid space, all symptoms and signs completely disappeared, his hoarse voice became normal and strong; and when I last saw him three years after he left my sanatorium he was in excellent health and regularly preached and conducted entire services twice every Sunday, in addition to addresses during the week. The patients were restored to health by sanatorium treatment and silence, without surgical interference and without any vaccine.

I am certain that numerous cases quite as gratifying could be cited by others as examples of the lasting arrest and practical cure of laryngeal tuberculosis by sanatorium methods alone. On the other hand, laryngeal lesions do not always disappear or improve concurrently with the pulmonary lesion, and then the desirability of direct local treatment demands consideration.

I do not pretend that residence in a sanatorium is essential in every case for the carrying out of sanatorium methods, but would urge that it is rarely possible to have the full advantage of these methods of treatment outside a sanatorium, and it is exceedingly difficult for a patient to entirely abstain from using the voice, even to the extent of never whispering, unless he is at a sanatorium. Nevertheless, in some cases we do get excellent results at the



FIG. 1.



FIG. 2.



FIG. 3.

FIG. 1. — Tuberculous deposit on right vocal cord, which disappeared after "silence" and lactic acid applied locally.

FIGS. 2 and 3. — Extensive laryngeal tuberculosis improved by injections of Koch's original tuberculin. FIG. 2, M. H. —, January 21, 1891. FIG. 3, M. H. —, March 11, 1891.

patient's home, and one patient whose laryngoscopic pictures will be thrown on the screen is an example in point, although in his case lactic acid was repeatedly applied to a small breaking-down tuberculoma.

Do climate and altitude *per se* influence the course of laryngeal disease apart from the effect of climate and altitude on the lung condition? I believe not, excepting in so far as high altitudes, say over 3000 ft., seem to be too stimulating and cause increased irritability of the larynx. I believe that moist climates, freedom from wind and dust, and moderate elevation are most favourable both for pulmonary and laryngeal tuberculosis. Dry air is of no account, because the normal nose completely warms and saturates inspired air before it reaches the larynx; but if a patient's nasal passages are deformed or diseased, so as to interfere with nasal respiration, the dryer the air the more the larynx will suffer. On

this account and for other reasons, nasal obstruction and intranasal disease should be dealt with—a point Dr. Dandas Grant has sufficiently emphasised.

The Influence of Tuberculin on Laryngeal Tuberculosis demands our serious consideration, and I am convinced that a large percentage of cases run a more favourable course with judiciously regulated administrations of tuberculin. After all, by the use of tuberculin we simply aim at the restoration and enforcement of those cellular functions which we believe are the chief means by which an attacked organism can overcome the infective invasion. In some who incur a tuberculous lesion these processes are set in motion without specific stimulation; in others we seek by sanatorium methods to increase the activity of biological processes generally; but whether we seek the same end by a sanatorium, or by the use of tuberculin, there is one essential factor we can never alter—the innate potentiality of response on the part of the individual's tissues; and I do not think we are justified in wilfully discarding the undoubted advantages of sanatorium methods in order to prove, what is equally beyond dispute, that tuberculin, whether antegenous or artificially prepared and administered, is capable, in certain and favourable cases, of determining arrest of a tuberculous infection.

My own experiences with the use of tuberculin in laryngeal tuberculosis began over twenty years ago, when in January, 1891, I used Koch's original tuberculin. In October, 1891, I communicated (1) to this Association in Bristol the results obtained in four cases; but they were all advanced cases of pulmonary tuberculosis with extensive laryngeal disease, and, as might now be expected, the results were not altogether encouraging. The initial dose in each case was 0.001 c.c. of the original fluid, gradually increased to 0.015 c.c. or more. In one case typical tuberculous ulceration of the vocal cords healed rapidly when the patient had received two injections, namely, 0.001 and 0.002 c.c.¹ He had seven injections in all, gained 9 lb. in weight in his last three weeks in the Royal Infirmary ward, and left very greatly improved and with a normal larynx.

What impressed me most of all in these cases was the very

¹ The solution injected was made by taking 1 c.c. of the original Koch's tuberculin and diluting it with 99 c.c. of a half per cent. solution of carbolic acid in distilled water. In order to be clear as to the dosage, I have indicated the corresponding amount of Koch's tuberculin administered, although at that time it was customary to express the dose in fractions of a gramme.

remarkable sedative effect of the injections, and in one case it was so pronounced that I gave the final injection of 0.1 c.c. solely for the purpose of obtaining relief from the intense pain in the larynx. Sprays and inhalations were unavailing, but the injection was followed by marked relief within a few hours, and did not return during the remaining eight days the patient continued to live.

Since those days we have learnt the importance of early diagnosis for treatment, and also the value of small doses, and my rule now is to aim at just avoiding any definite febrile reaction. I generally advise either bacillary emulsion, beginning with $\frac{1}{50000}$ grm., or P.T.O. in gradually increasing doses from 0.0001 running up to 1.0 c.c., giving about two injections a week; and then continuing with either bacillary emulsion, or else P.T. beginning with 0.02 c.c. and gradually increasing. With bacillary emulsions I think Professor Walker Hall's method of adding 5 per cent. of nucleinate of soda tends to promote leucocytosis and is therefore an advantage. But in every case I try to just avoid reactions, and if a slight febrile reaction occurs I think it is better to keep repeating the same dose till no febrile reaction is produced before increasing the dosage. Excessive local reaction is attended with inflammation and cedematous infiltration, which may be so acute as to result in tissue necrosis, and as a consequence a quiescent local infection may become active, and the infection may be made to spread to fresh foci. Therefore the effect of any given dose should be noted before increasing the amount of subsequent doses.

We have much to learn, not only in regard to the influence of mixed infection, but also as to the differentiation between varieties of tubercle bacilli and their typical clinical manifestations. There is some reason to believe that pulmonary tuberculosis, and therefore its laryngeal complications, are due to human type infection; and that primary abdominal lymphoid gland tubercle and lupus are generally due to bovine type infection. Nathan Raw has adduced very strong reasons in its support, and though the arguments for or against this thesis are rather outside our discussion, we are concerned in so far as our choice of tuberculin is determined by such views. Raw (23) concludes that "the two diseases are so rarely seen together in the human, that there seems to be some ground for presuming that they are antagonistic to each other, and that bovine tuberculous may possibly confer an immunity against human tuberculosis," and in this view I concur.

Local Treatment must be considered under two headings: treatment which aims at eradicating the lesions, and treatment which aims at relieving the patient's sufferings, where palliative measures alone are possible.

Can we ever expect to cure a tuberculous larynx by the help of local treatment? If not our patients ought to be spared the discomfort or suffering which surgical interference involves. In some cases where the infection is conveyed to the larynx through the lymphatics, resulting in a widespread acute miliary laryngeal tuberculosis, no local treatment can arrest the disease, but the majority of tuberculous laryngeal lesions are the result of local invasion, either through the surface epithelium, as shown in the



FIG. 4.



FIG. 5.



FIG. 6.



FIG. 7.



FIG. 8.

FIG. 4.—Section of a tonsil, showing the entrance of tubercle bacilli through the unbroken surface epithelium.—Jonathan Wright.

FIGS. 5, 6, 7, and 8.—Localised laryngeal tuberculosis of right arytaenoid and ventricular band, etc. Fig. 5, February 18. Fig. 6, March 26. Fig. 7, March 28, one hour and a half after injection. Fig. 8, July 4, showing the effect of submucous injection of guaiacol.

section from one of Jonathan Wright's specimens, which I will show on the screen, or else through the ducts of the glands as demonstrated to this Section by Jobson Horne in 1905. I have already suggested that under general treatment, combined with complete abstinence from the use of the voice, these local infections will very frequently subside as the pulmonary lesions improve. But there are other cases where the larynx does not improve, and sometimes where the laryngeal infection progresses even under rigid sanatorium methods. Then we ought to decide whether local treatment will tend to arrest the laryngeal disease. If there is

localised ulceration, I have found that careful and firm applications of lactic acid to the ulcers tends to make them heal. When a circumscribed tuberculous deposit causes excessive pain which cannot otherwise be relieved, it may be removed, and the cut surface treated as a tuberculous ulcer; and I have never seen any case in which the tuberculous infection spread in consequence. But where ulceration has not already caused a breach of surface, I think these localised tuberculous deposits are better treated by submucous injection. I have resorted to submucous injections for nearly twenty years, and though I frankly confess the cases in which these injections appear suitable and necessary are relatively few in number, the results have been remarkably beneficial.

I will briefly relate one illustrative case of a patient who for thirteen months had complained of pain in the region of the right thyroid ala, the pain increasing until, shortly before I saw her, she could swallow nothing without previous applications of cocaine to the larynx, and even then swallowing food was painful. The right arytaenoid, together with the arytaeno-epiglottic fold, was merged in a large semiglobular tuberculoma, which partly encroached on the glottic aperture, and extended outwards to the outer surface of the cricoid cartilage. She was hoarse, weak and thin (weight, 6 st. 9 lb.), with both apices involved. Six weeks later the swelling in the larynx had increased, and a superficial ulcer could be seen, by the Killian position, on the deep inner side of the laryngeal swelling. She went to Nordrach-on-Mendip Sanatorium, and there I made two submucous injections into the swelling of 50 per cent. solution of guaiacol. The pain was rather marked until the following day, and then was gradually relieved, so that in four days' time she could swallow anything without pain and without resort to any local anaesthetic. Although she used a cocaine spray a few times she steadily improved, lost all pain, the voice recovered completely, and the swelling disappeared almost completely. In three months she gained 12 lb. The relief had been so remarkable that she was anxious to have more injections, but I found no reason to repeat them. In a further three months she declared she felt "splendidly well, better than I have for many years; the throat never pains or even bothers me now; all the relief without question dates from the injection." Meanwhile she had had the advantage of sanatorium treatment under Dr. Thurnam, with silence not very rigidly carried out.

There is one class of local lesion to which I invite attention—namely, those chronic cases of tuberculous larynx in which firm

fibrous granulations are projecting from the interarytenoid space or from the vocal cords, and, while being perfectly quiescent, cause aphonia. If the pulmonary lesion has healed or has become quiescent, and the patient's general health is good, I see no reason why we should refuse to restore or improve a voice, if it seems probable this can be brought about by removal of the mechanical obstruction to the apposition of the cords.

My colleague, Dr. Dundas Grant, has referred to the value of galvano-caustic punctures. I do not propose to add anything further on that method beyond stating that I have found it valuable in circumscribed lesions, particularly when the position of the lesions renders it difficult to make submucous injections.

The partial or complete removal of the upper half of the epiglottis I have occasionally found most beneficial when ulcerating tuberculous deposits are causing much pain. In favourable cases,

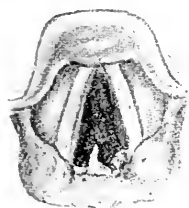


FIG. 9.



FIG. 10.



FIG. 11.

FIGS. 9 and 10.—Chronic laryngeal tuberculosis before and after curettement and lactic acid applications.

FIG. 11.—Laryngeal stenosis, due to extensive tuberculous deposit with fracture of the vocal cords, requiring tracheotomy.

where the lung condition and general state of the patient is relatively satisfactory, a clean extirpation of the ulcerated epiglottis improves the patient's chances and adds immensely to his comfort, while even in patients for whom recovery is out of the question the relief of pain may be far more complete than can be obtained by local sedatives. Yet cocaine or novocain sprayings, or orthoform insufflations, etc., or morphine or codeine internally, are often invaluable, and in the majority of cases render ablation of the epiglottis quite unnecessary. Very occasionally tuberculous disease in the larynx causes such marked narrowing of the air-tract that tracheotomy becomes necessary to relieve dyspnoea, and even when actual asphyxia is not feared the relief from respiratory embarrassment that tracheotomy affords is worth remembering.

I fear that in my very incomplete sketch of what appear to me to be the principles which underly the proper treatment of laryngeal

tuberculosis I have laid myself open to the accusation that I have said nothing fresh, and have not even laid down rules for our guidance. To the latter charge my reply must be that it seems to me that no hard or fast rules are possible—each case must be dealt with on its merits, and whether any local treatment is desirable, and if so, what form it should take, depends very greatly on the general condition of the patient, the activity and extent of the pulmonary lesion, the patient's response to general treatment, as well as on the situation, extent, and character of the laryngeal complication. But my parting word is to avoid local treatment unless there is a definite and strong reason for interference.

REFERENCE.

- (1) WATSON-WILLIAMS, P.—"On Tuberculin in Laryngeal Tuberculosis," *Provincial Medical Journal*, November, 1891. (See also Watson-Williams and F. J. Wethered, "Koch's Treatment of Tuberculosis," *Medical Annual*, 1891, p. 461.)

III.—G. SECCOMBE HETT, M.B.LOND., F.R.C.S.ENG.,
Surgeon-Laryngologist to Mount Vernon Hospital for Consumption, etc.

I HAVE here some notes of private cases and others from records of the Mount Vernon Hospital, together with macroscopic and microscopic specimens, to which, if I may, I will call your attention. They illustrate some special points in the surgical treatment of tuberculous laryngitis, and from them I think certain deductions may be drawn.

My observations are taken from 350 cases of tubercle of the larynx, in which, besides the local condition, records have been kept of the condition of the chest, the course of the case, the patient's general condition, resisting power, and the pathological findings. These cases have been followed up as far as possible in their after-history.

The various kinds of local treatment have been applied and contrasted.

For practical purposes one can assume that all cases of laryngeal tuberculosis are associated with a pulmonary tuberculosis, either active or quiescent. It is an old-established and well-known fact that if the chest condition is favourable the larynx may become arrested. This, however, is in my belief not necessarily so, unless the laryngeal condition is treated as well as the pulmonary. I

would put in a strong plea for the routine examination of the larynx in cases of phthisis, so that if the latter is diseased, it may be diagnosed and treated early. At Mount Vernon Hospital, where all cases are examined by the laryngoscope on admission as a routine, it is not infrequently found that there is a local tubercle, although the patient has no symptoms.

It is also a fact that in some cases where the chest is riddled with tubercle the disease in the larynx can be arrested, so that even if the patient dies within a few months he is spared that most distressing and painful end, worn out by pain and starved from inability to take nourishment, which may occur in a case of tuberculous laryngitis. There is also a brighter side to the results of local treatment, and the latter is by no means concerned alone, or even to a large extent, in affording relief to a painful death. My records show cases in which extensive signs in the chest were associated with considerable laryngeal disease, and yet the patients are in a very fair health and able to attend to the ordinary affairs of life several years afterwards.

I have been speaking of the serious cases with extensive and wide-spread laryngeal lesions. In localised laryngeal disease, provided the chest affection can be arrested, the prognosis is often very fair. I should like to say a word about the classification of tuberculous laryngitis. This has an important bearing on the line of treatment to be adopted and the results which can be expected from such treatment.

It seems desirable that some more satisfactory classification of the results of the infection of tubercle bacillus on the larynx could be evolved other than that at present in vogue. We are accustomed to read that there is a condition known as "tuberculosis of the larynx"; that this is associated with tuberculosis of the chest, has definite clinical characters, and a somewhat grave prognosis; that there is another condition called "lupus," with definite local signs, associated usually with so-called lupus of the nose and pharynx, and usually unassociated with tuberculosis of the chest; that the former condition is common, the latter rare, and that they are two sharply defined and entirely different types of disease.

Lupus of the larynx is often said to be so benign that it heals spontaneously and requires no local treatment, while in tubercle of the larynx active local treatment is taboo as being useless, dangerous, and unjustifiable, and so the latter also is severely left alone. These statements are, however, incorrect, and many intermediate forms are seen, in most of which local treatment is useful.

The records of Mount Vernon Hospital show cases presenting the clinical picture of lupus of the larynx, in which the patient has some dysphagia and pulmonary tuberclosis is present, and where there is no sign of past or present lupus in the nose, throat, or skin, and these cases are not uncommon; in other words, they violate one or more of the points laid down in text-books as being important in a differential diagnosis between the two conditions. The local signs are often intermediate: thus, the epiglottis may be lupoid, while other portions of the larynx are definitely tuberculous.

The pathological findings of Dr. H. G. Butterfield coincide with the clinical appearances noted. Of the cases under my care from which portions of the larynx were removed surgically, tubercle bacilli were demonstrated in nearly all. The microscopic appearances of the series varied from acute tuberculous lesions to very chronic ones in which tubercle bacilli were hard to demonstrate, and in some cases could only be done by special methods, such as that of Mueh. The specimens did not fall into sharply defined classes, intermediate forms being found (see pathological reports on series of cases).

It is conceivable that two different types of infection may exist, such as bovine tubercle at one end of the series and human tubercle at the other, while intermediate forms are due to mixed infections, but this, of course, is merely surmise.

The clinical appearance of the larynx and the course of the case is usually directly proportionate to the capacity for healing in the chest or its chronicity—that is to say, to the resisting power of the individual.

Septic infection may be superadded at any time, and this is especially the case where there is ulceration, even in the most chronic or lupoid cases. When this occurs the condition of the larynx may become rapidly desperate. This is an indication that even in chronic cases an arrest should be brought about as rapidly as possible.

As a rule, the more chronic type of phthisis is associated with a laryngeal condition which, even if extensive, responds well to local treatment. I have had cases with chests so riddled, and with such extensive signs in addition to the laryngeal lesion, that the physician has questioned whether they should be given sanatorium treatment. In such cases, if the temperature were normal and the patient fairly well and gaining weight under sanatorium treatment, it was found possible to do radical treatment, and often to achieve good results.

A point upon which I would lay stress is the necessity for the co-operation of the physician and laryngologist in deciding whether radical measures should be adopted.

I do not consider that operations, such as the removal of the epiglottis, should be performed in the out-patient department. If such be done, a very pessimistic view of the results of radical treatment will be taken. The patient should be under observation in a sanatorium, or under similar conditions where the resisting power can be carefully ganged. If this be done, much more radical proceedings can be adopted, and consequently there is a greater chance of arrest (see Case 12).

In my department most local applications have been abandoned as a means of arrest. The simple laryngeal alkaline spray is used for cleaning purposes, vocal rest is systematically carried out, and surgical measures are used if necessary. On these two latter methods I rely mainly for hope of arrest, together with and while the patient is under sanatorium conditions. Local sedatives are employed to relieve dysphagia, etc.

In tuberculosis of the larynx limited to the vocal cords, absolute vocal rest for six months will generally bring about arrest if general treatment is carried out and the chest becomes quiescent. Localised lesions and ulcers of the cords are treated by one or two applications of the cautery, and this has seemed to aid the healing (see Case 13).

Where the cords are affected, unnecessary coughing must be avoided by the patient, and for this purpose dry inhalations of creosote, phenol, and tincture of iodine are very useful.

For affections of the arytenoids or interarytenoid region I use the deep cautery-puncture. This frequently brings about arrest, but if the part affected does not begin to react favourably after several applications at fortnightly intervals, I have no hesitation in punching out the swollen arytenoid or interarytenoid growth. I have never seen failure of healing in the cases thus treated (see Case 3).

In infiltration of the ventricular bands I employ deep cautery-puncture exclusively. Frequently the infiltration is massive, and long-continued applications are necessary.

Lesions of the epiglottis require special mention, for the treatment of epiglottitis disease is a debatable subject. I advise vocal rest and sanatorium treatment to start with, but do not find that arrest is brought about, as a rule, by these means alone.

More usually there is ulceration and dysphagia or the lesion

continues to progress. My practice is, then, to advise removal, if such removal seems justifiable, and after the patient's general condition and resting power has been carefully studied.

In very chronic cases of epiglottic disease the epiglottis sometimes ulcerates away down to the base of the tongue, where the process stops and spontaneous arrest occurs. This process is, however, slow and uncertain, and intercurrent septic infection may occur, or the tuberculous process may spread along the aryepiglottic folds or other parts of the larynx become infected. These chronic cases are very favourable ones for removal, especially if the disease is limited mainly or entirely to the epiglottis, and so the slow, dangerous and uncertain surgery of Nature should be anticipated.

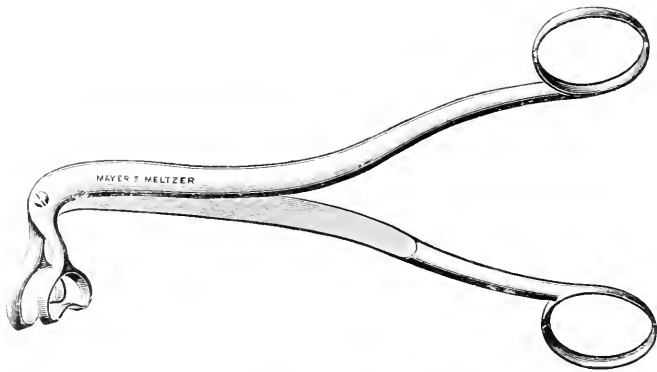


FIG. 1 -- Epiglottidectomy forceps.

The cautery is advocated for the arrest of tubercle of the epiglottis. I have found, however, that this is ineffective. I have tried it in chronic cases, but have finally had to remove the epiglottis. One case was vigorously and deeply punctured at intervals of a fortnight for three months without much difference in the appearance of the organ, and was then removed with a perfect result.

Where the patient's general condition, from a widespread or rapidly progressive nature of the lung lesion or other cause, precludes radical measures, and dysphagia is troublesome, I apply galvanocautery puncture to the epiglottis and arytenoids for the relief of pain, and often find that it acts like a charm.

With regard to the prognosis after the removal of the epiglottis, punching out arytenoid infiltrations, or interarytenoid tuberculous ulcerations, I have been struck by the excellent healing after these

proceedings. Of the latter two every case healed well. Out of 350 cases of tuberculous laryngitis, removal of the epiglottis was disussed in 30 and carried out in 24. Two cases of the 30 healed spontaneously under sanatorium treatment, but one patient was having iodides, and the other was suspected of being specific. Three others were unsuitable owing to their general condition, and so were not operated on. Of the 24 cases operated on, all healed perfectly within a fortnight except one very advanced case, who died from a pulmonary hæmorrhage. In those cases in which the epiglottis was the only portion of the larynx affected the results have been perfect (see Case 10).

Where there has been disease of the other portion of the larynx, the ultimate results have depended on whether local and general treatment have been able to check this. In no case was the condition of the larynx rendered worse. In every case where



FIG. 2.—Epiglottis fixation forceps.

dysphagia was present this has been cured. In several cases of very advanced and extensive laryngeal disease, arrest has been able to be brought about after removal of the diseased epiglottis (see Case 12).

No patient had hæmorrhage from the stump, difficulty of swallowing, or other complication after the operation. There was seldom a rise of temperature, and no unfavourable result on the lung condition was produced. I think one should lay stress on the fact that no patient has had any ultimate bad effect from the loss of his epiglottis, and that after the operation there need be no fear of "food going the wrong way." There is a superstition to this effect which dies very hard.

The epiglottis should be removed as completely as possible. I have seen the cut edge break down and become tuberculous where only a portion has been removed for local ulceration.

To effect removal I use a modified Luke's epiglottidectomy forceps and pull the epiglottis as far as possible through the ring of the instrument. This is done by threading a silk ligature

through the epiglottis and then through the ring of the instrument, or else by fixing a catch forceps on to the epiglottis and then passing the latter through the epiglottidectomy forceps. If a ligature is used, I employ Horsford's needle forceps to pass it through the epiglottis. Horsford's instrument is an excellent one, but it is sometimes difficult to thread it through the epiglottis, and

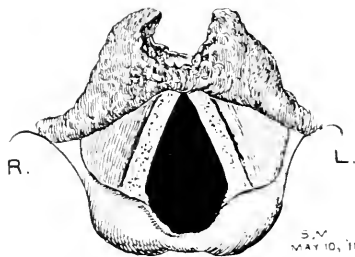


FIG. 3.—Case 5.



FIG. 4.—Case 6.

so I have modified Tilley's tonsil catch forceps for the purpose. The pattern of epiglottidectomy forceps which I use is modified, so that it makes a V-shaped instead of a circular or flat cut; this enables a more complete removal to be effected. [Mr. Hett here demonstrated the method of using the instruments upon a *post-mortem* specimen.]

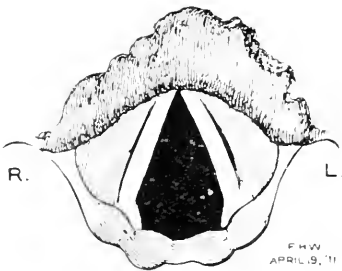


FIG. 5.—Case 7.



FIG. 6.—Case 9.

In cases of interarytenoid tuberculous growths I remove the growth with Lake's forceps, or, if small, employ galvano-cantery puncture. It is noteworthy that in many such cases there is a lesion of the nose, such as a septal deflection, atrophic rhinitis, polyp, or chronic sinus disease. Probably the tuberculous process has started in an already-established simple interarytenoid pachydermia, which is secondary to an affection of the nose. Bearing

this in mind, I treat, and, if necessary, operate upon pathological conditions of the nose in cases of phthisis. In operations upon the nose in these patients local anaesthesia is generally employed (see Case 16).

In tuberculous ulcerations of the larynx I employ the curette where the patient's condition warrants it, and then rub in carbolic

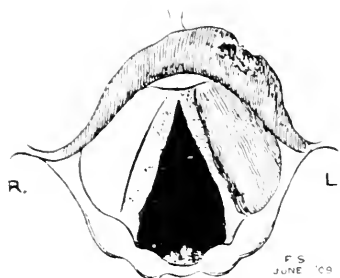


FIG. 7.—Case 10.



FIG. 8.—Case 11.

acid, formalin, and lactic acid. This is generally done by the direct method, especially in subglottic ulcers. Caution should, I think, be exercised in the use of the curette, as there is often considerable reaction, and I regard it as a more serious procedure than removal of the epiglottis and arytenoids.

Pedunculated tuberculomata sometimes impede the movements

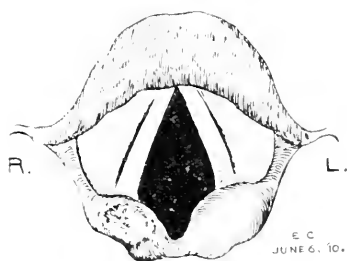


FIG. 9.—Case 12.

of the vocal cords and cause irritation of the larynx or obstruction to respiration. These I remove by the direct method with Paterson's forceps (see Case 11).

Tracheotomy may be necessary for the prevention of asphyxia, although this is rare in tuberculosis of the larynx. It occurs, however, in some chronic and massive infiltrations of the larynx where the ventricular bands or subglottic growth actually obstruct res-

piration. It is noteworthy that in these cases the vocal cords are sometimes unaffected and phonation is good. The enforced vocal rest due to tracheotomy may cause complete arrest of the tuberculous process.

The tracheotomy tube can seldom be dispensed with. I hardly feel that tracheotomy is justifiable to ensure vocal rest, and should not employ it unless obstruction to respiration rendered the procedure imperative (see Case 15).

A syphilitic process in the larynx may be associated with phthisis and the diagnosis rendered difficult (see Case 9). In one case an infiltration of the epiglottis responded to anti-specific treatment during treatment in hospital for phthisis, but the patient returned later with an ulcer on the epiglottis. This was diagnosed clinically as tuberculous and the epiglottis removed. Sections of the ulcer showed tubercle bacilli (see Case 10).

Lastly, I should like to point out that after removal of the epiglottis the cut surface heals almost like an aseptic wound. Sections have been cut of every case, and are shown with the macroscopic specimens. In nearly every case tubercle bacilli are to be seen, and in two cases in which this is not the case the structure is typically tuberculous. One case where the epiglottis is shown and also the larynx (the latter removed *post mortem*), the stump of the epiglottis is soundly healed and healthy. This patient died three months after operation from a pneumothorax.

The appended notes of twelve typical cases show the after-course of the cases, and the temperature charts demonstrated that no undue reaction followed. The notes of a case with a large tuberculous abscess in the mid-line of the neck, due to a tuberculous perichondritis of the larynx, together with a photograph of the condition before operation, are shown (see Case 1).

These cases have all undergone surgical treatment, and macroscopic specimens with microscopic section accompany the notes in each case where a surgical removal has been effected. The specimens of epiglottis show every stage of disease. Some show widespread infiltration without ulceration, others localised superficial ulceration, while several show deep excavating ulcers with erosion of cartilage.

CASE I.—W. T.—. Seen on June 10, 1911. The patient was a somewhat emaciated man, aged forty-five, a painter by trade. He complained of hoarseness, shortness of breath, and cough of five months' duration. He had also had a swelling in the neck for three months, which had been increasing in size lately. On examination of the neck there was a large, cystic, semipendulous swelling in the

mid-line of the neck deeply attached in the thyro-hyoid region. The skin was movable over the swelling. The swelling was the size of a turkey's egg.

Laryngoscopic Examination.—The mucous membrane of the larynx was catarrhal, and the left arytenoid was swollen and oedematous. There were active signs of phthisis over both upper lobes. An incision was made over the swelling under local anaesthesia, and a thick-walled tuberculous abscess dissected out. The cavity led to the neighbourhood of the left crico-arytenoid joint. The incision healed fairly well, and the patient is able to do light work.

CASE 2.—J. P.—. First seen on July 12, 1909. The patient, a man, aged forty-three, was seen complaining of hoarseness of eighteen months' duration. Dysphagia and shortness of breath had recently come on. On examination he was found to have widespread disease of the larynx. The epiglottis was very much enlarged. Both arytenoids were swollen, as were also the ventricular bands. The chest showed consolidation of both upper lobes, with crepitations at the apices.

July 27.—Patient was put under sanatorium conditions. Tubercle bacilli were present in the sputum, and there was a tuberculous ulcer on the buccal surface of the right cheek.

August 3.—Patient's general condition was improving, although the chest signs were active. The epiglottis was removed.

August 17.—The epiglottis stump was healthy. The ulcer on the cheek was treated by applications of lactic acid. The arytenoid on the left was punched out.

September 21.—The laryngeal condition was improved. The stumps of epiglottis and arytenoid were healed. The dysphagia was gone, and he felt pretty well. The chest condition, however, remained much the same. He remained in hospital for a short time longer, the larynx continuing satisfactory.

Pathological Report.—The specimen was sent as a tuberculous epiglottis. The appearances are those of a structure composed of a fairly fine fibrous reticulum, the meshes of which are occupied by extravasated red blood-corpuscles, lymphocytes and leucocytes, and covered by a squamous epithelium. The whole of this, including the epithelium, is affected by the tuberculous infection, *the nature of which was definitely proved by the finding of the bacillus*. The epithelium is necrotic and ulcerated in places, and very little of it exhibits normal staining reactions. Giant cell systems are numerous.

CASE 3.—A. S.—. The patient was an undersized, anemic clerk, aged twenty-two. He was seen at a throat hospital, where he had been admitted for difficulty of swallowing. He was very ill and weak, and had a high, irregular temperature.

He was admitted to the Consumption Hospital on April 27, 1909. On admission he was found to have widespread laryngeal disease. The epiglottis was swollen and dependent. The ventricular bands were hypertrophied, and the arytenoids enlarged, glistening, and oedematous. There was an ulcer the size of half a crown on the posterior pharyngeal wall. There were signs of cavitation at both apices. He was kept in bed, and local applications were applied to the pharynx. He improved in condition, and was sufficiently well in a fortnight to allow of the application of the cautery to the arytenoids, which lessened his dysphagia. Tubercle bacilli were found in the sputum.

July 6.—The left arytenoid was punched out.

July 27.—The right arytenoid was punched out.

Both cut surfaces healed well, and he was now up all day with a normal temperature. The cautery applications were continued to the epiglottis and ventricular bands. His condition was now very much improved, and the ulcer on the posterior pharyngeal wall was healed. There was still infiltration of the larynx, but he had a fair voice and no dysphagia.

He was readmitted in September, as the condition of the larynx was not very satisfactory, although his general health was fair and he could attend to his business.

September 21.—The epiglottis was removed.

September 28 to October 5.—Applications of the cautery were made to the ventricular bands.

October 19.—There was some infiltration, and granulations were present in the neighbourhood of the left aryepiglottic fold. This was punched out.

November 2.—His condition was good and the larynx showed healed cicatrices. Subsequently the patient was seen in the out-patient department during 1910, when the larynx showed no signs of active tubercle. The patient was fairly well and had a normal temperature. In all seventeen applications of the cautery were made to the larynx, in addition to the removal of the epiglottis and both arytenoid swellings.

Pathological Report.—The arytenoid removed was found, on microscopical examination, to consist very largely of a fine fibrous reticulum with very few cells and with distinct evidence of having been infiltrated with fluid. The changes are practically confined to the periphery, and consist of masses of plasma and endothelial cells, with here and there a complete giant-cell system. The epithelium is complete over the whole of the arytenoid, and shows very little irregularity of any kind. There are extravasations of blood here and there, which probably resulted from manipulation during the operative procedures. *Tubercle bacilli were found on examination.*

CASE 4.—K. R. —. Seen on June 17, 1909. The patient, an unmarried woman aged twenty-nine, was admitted complaining of hoarseness and dysphagia. On examination the epiglottis was found to be much enlarged and infiltrated. There was swelling of the left aryepiglottic fold and ulceration and infiltration of the left ventricular band. There was considerable consolidation of the right upper lobe. *Tubercle bacilli* were present in the sputum.

June 30.—The epiglottis was removed.

July 6.—The epiglottis stump was clean and healing.

The stump was well healed a fortnight from the time of operation, with subsidence of all dysphagia and improvement of the general condition. The patient left hospital and was fairly well until 1911, when she developed tuberculous disease of the spine.

Pathological Report.—This specimen shows the whole body of the epiglottis converted into a mass of granulomatous material with giant-cell systems in all stages of formation. Here the epithelium is markedly affected, and is proliferating in a distinctly irregular manner. The description can be summed up as an early stage of the condition seen in the cases of B— and I—, where the process has advanced a stage further, and the epithelium has become necrotic. In this case the clinical diagnosis has been confirmed by the finding of *tubercle bacilli*.

CASE 5.—S. M. —, a shoemaker, aged forty-three. Admitted into Mount Vernon Hospital on May 9, 1911, complaining of cough and expectoration for over two years: hoarseness for about a year. The laryngoscopic examination showed a broken-down chronically infiltrated epiglottis, reddening and thickening of the ventricular bands, and markedly enlarged arytenoids. Chronic widespread infiltration of both lungs with thickened pleura was found. *Tubercle bacilli* were not found in the sputum, which was mucopurulent, until the fourth examination.

May 16.—The epiglottis was removed. No consequent reaction or rise of temperature took place and the stump healed well.

June 12.—The swelling of the arytenoids had very much diminished.

June 26.—The patient had been treated by injections of tuberculin, and by this date had reached 1 mgrm. of T.R. The moist sounds had almost disappeared and the sputum was considerably diminished. The temperature was afebrile throughout, and the patient had gained four pounds in weight. His general condition was good, and he returned to his occupation of hawker of cheap jewellery.

Pathological Report.—Tuberculous epiglottitis. The portion of this epiglottis examined shows a very sharp demarcation between the regions affected by disease and those unaffected. The central portion around the cartilage is entirely fibromatous, but the whole of the periphery of the epiglottis is affected by inflammatory changes of a granulomatous character. There are typical giant-cell systems in all stages of advancement up to the fully formed, but no areas of necrosis of any size. An *acid-fast bacillus* was found in the neighbourhood of the giant-cell systems which was not absolutely typical in its morphology, but *which was in all probability a true tubercle bacillus*. Readings on Leitz stage: Horizontal, 0-12·8; vertical 0-108·1.

CASE 6.—H. H.—. This patient was aged twenty-eight when he came to the hospital. He was admitted as an in-patient on October 18, 1910, with cough, weakness and emaciation, dyspnoea, and much expectoration. His voice was normal, but he had a slight thickness of the throat. The epiglottis was infiltrated and ulcerated, and he had some inter-arytenoid swelling. The chest showed affection of all the lobes with cavities in both upper lobes. There was a good deal of fibrosis, the pleurae were thickened, and there were scattered crepitations over both lungs and tubercle bacilli in the sputum. The patient was kept in hospital for five months, and was treated by oral administration of tuberculin (T.R.).

March 7, 1911.—The larynx began to progress, and he was readmitted and the epiglottis removed. No rise of temperature or exacerbation of the chest signs took place. In hospital he gained twelve pounds, and has been much stronger since.

May, 1911.—He was seen at this time and had remained pretty well. The laryngeal condition was healthy—no signs of active tubercle in the larynx.

Pathological Report.—Tuberculous epiglottitis. Practically the whole of the portion removed for examination was fibromatous in character, with here and there large collections of small round-cells in the neighbourhood of the epithelium, which showed no signs of ulceration. One specimen showed a *collection of giant-cells of tuberculous type*, but no tubercle bacilli were found after repeated attempts.

CASE 7.—F. H. W.—. This patient was aged thirty-seven and by profession a clerk. He was admitted to the out-patient department at Mount Vernon Hospital on March 7, 1911, but eight months previous to this date had begun to find his voice weak. He had had a cough and hoarseness for four months, and had lost weight. The epiglottis was infiltrated and ulcerated at the edge, the cartilage being exposed. The right upper lobe was consolidated, and dry crepitations were heard over it. The left apex was slightly involved.

March 27.—He was admitted as an in-patient. There was much pyorrhoea and some septic stumps. The mouth was rendered as aseptic as possible by extractions and local treatment. Three applications were made of the galvano-cautery to the swollen epiglottis. No improvement of the laryngeal lesion occurred, and the arytenoids became swollen.

April 26.—The epiglottis was removed.

May 17.—On this date the patient was discharged, having gained ten pounds.

Subsequently he was seen in June, 1911, when his throat was arrested and healthy.

Pathological Report.—The changes in this case are active, and show every sign of having a considerable duration. Practically every lesion is very close to the

epithelium, and is composed of granulation-tissue of some length of standing, containing *typical giant-cell systems*. The entire extent of the remainder of the epiglottis has become more or less fibromatous, while the tuberculous lesions themselves are showing distinct signs of assuming a fibromatous character. Vessels are very numerous and well formed, and the epithelium over its entire extent shows very well-marked acanthosis. After repeated examination no tubercle bacilli could be found.

CASE 8.—J. I.—. The patient, a man aged thirty, looked weak and ill and was admitted to the hospital on May 27, 1909. He complained of cough, weakness, blood-spitting, and shortness of breath of over a year's standing. For two months he had had hoarseness and recently great pain on swallowing, so that he said he was starving for want of food. On examination the epiglottis was found greatly swollen, while there was widespread tuberculous disease of the vocal cords, ventricular bands, and arytenoids. Both upper lobes were invaded and his general condition was very bad. The advisability of removal of the epiglottis as a palliative for the extreme dysphagia was made the subject of a consultation and was finally decided on, the circumstances being fully explained to the patient.

June 12.—This was carried out after the patient had been given complete rest under sanatorium conditions. The dysphagia was completely relieved and the stump healed, despite the widespread laryngeal disease. The general condition improved somewhat during his stay in hospital.

Pathological Report.—The whole of the epiglottis is affected throughout and shows numerous giant-cells in all stages of growth. The epithelium is necrotic and ulcerated over a large part of its extent. The clinical diagnosis was confirmed by *finding tubercle bacilli in the greatest profusion*.

CASE 9.—G. P.—. The patient is aged twenty-three and a labourer. A man of poor physique: he had had a cough for three years, and was attending the out-patient department for this when he became hoarse and had pain on swallowing.

February, 1909.—He was seen in the throat department, and found to have reddening and thickening of both ventricular bands, with an ulcer on the right ventricular band extending on to the vocal process. The ulcer looked like a tuberculous one. The ulcer was curetted several times. The right ventricular band became much swollen, but the condition settled down, and he was discharged as arrested.

February, 1910.—He again attended with some infiltration (not very active) of the right ventricular band, but the epiglottis was much swollen and thickened, and he was again admitted. A syphilitic rash developed on his elbows, and he was put on iodide and mercury. I was, however, nearly certain that the larynx was tuberculous, and it did not react to anti-specific treatment. A von Pirquet gave a positive result, although the chest signs were indefinite and no tubercle bacilli could be found in the sputum on repeated examination. The cauterization was given a trial, but, as the condition continued to progress and dysphagia was marked, the epiglottis was removed. The stump healed perfectly and the symptoms were relieved. Examination showed a typical tuberculous epiglottis with bacilli in section. The larynx has remained arrested, with a healthy stump of epiglottis. There is still some infiltration of the right ventricular band. Patient is well and able to follow his occupation.

Pathological Report.—In this case practically the whole of the epiglottis is abnormal in structure, in that it is almost entirely composed of granulation-tissue and giant-cell systems in all stages of formation, with small necrotic areas here and there. There is patchy, irregular, lymphocytic infiltration over the whole of the tissue immediately underlying the epithelium, which shows marked necrosis

and ulceration, particularly on the upper and posterior surfaces. In the small area at the base of the epiglottis, which is apparently normal, the vessels are thickened, and show a well-marked perivascular infiltration with lymphocytes. *Tubercle bacilli were readily found on examination.*

CASE 10.—F. S.—. The patient is aged thirty-nine, and by profession a coachman.

May, 1909.—Was seen at Mount Vernon Hospital. He complained of cough and hoarseness, which he had had for one year. The cords were red and thickened, the left ventricular band was enlarged, and he had a slight interarytenoid pachydermia. There was a syphilitic history, and the laryngeal condition cleared up under mercury and pot. iod.

Chest Condition.—The right upper lobe was consolidated, there were moist sounds, and the signs of a cavity at the left apex.

July, 1910.—He was readmitted because the left side of the epiglottis became infiltrated and broke down forming an ulcer, which was thought to be tuberculous. The epiglottis was removed, and showed a clean healthy stump ten days after. There was no rise of temperature before or after removal of the epiglottis. No other portion of the larynx showed signs of tubercle. The patient's general condition was fair, although there were still some moist signs in the right lung at the time of his discharge from hospital.

July, 1911.—The patient was well and the larynx remained arrested. He was following his occupation and had a good voice. Examinations of sections of the epiglottis showed tubercle bacilli.

Pathological Report.—The changes down the posterior surface of the epiglottis are those consistent with a diagnosis of acute tuberculous infection. The whole of the tissue on this side is extremely cellular and shows numerous groups of well-marked giant-cell systems, in and around which *numerous tubercle bacilli were found without any difficulty.* On the lingual surface of the epiglottis the appearances are quite different. Here there is merely a loose, ordinary looking connective tissue, but there are quite distinct and localised perivascular infiltrations. Immediately underneath the epithelium on this surface, from the tip to half-way down the epiglottis, there is a well-marked cellular infiltration composed almost entirely of lymphocytes. The epithelium itself is practically normal, except at the tip, where it shows well marked irregular proliferations.

CASE 11.—C. A. P.—. Seen on March 3, 1909. The patient, a strong athletic man, aged twenty-seven, came complaining of no singing voice for five months. Huskiness and hoarseness of three months' duration. On examination there was infiltration and ulceration of the epiglottis, swelling of the right arytenoid, and a granulation on the right vocal process and right vocal cord. On examination of the chest, consolidation of the left upper lobe and right apex were found by Dr. F. W. Price. There was about 3 oz. of expectoration in twenty-four hours, and tubercle bacilli were abundant in the latter (H. G. Butterfield). The patient was put under sanatorium conditions, with vocal rest.

March 10.—The epiglottis was removed. The stump healed well, and the patient's expectoration diminished. He gained weight rapidly. Temperature 100° F. at night up till the end of April.

June 30.—Granulation removed and right vocal process curetted by the direct method. Subsequently three applications of the cautery were made at intervals to the right arytenoid.

September 23.—Larynx arrested. No tubercle bacilli in sputum. General condition satisfactory. Temperature normal at night.

August 24, 1910.—Patient has returned to his professional work as a naval officer. Larynx and chest remain arrested, and there is no sputum. Sub-

sequently he went on foreign service, and when last heard of was perfectly well and had a normal voice. The epiglottis, which was shown at the meeting, presented the above characters. A section of the epiglottis was also shown. Mr. Butterfield's report, together with the laryngoscopic appearances, are included below.

Pathological Report.—The appearances presented by the specimen sent for examination are those of acute tuberculous disease of the epiglottis. There is little or no fibrosis, and the whole extent of the epiglottis appears to have been a good deal infiltrated with fluid exudate. The majority of the cells visible are plasma and endothelial cells. *There are a good many quite typical giant-cell systems with tubercle bacilli both in and between them.* There is no marked change in the epithelium beyond what one would expect to find in the covering of a structure affected by acute inflammation. The readings are: Horizontal, 0-161; vertical, 0-1066. Associated with the tubercle bacillus in this case were the following organisms: Gram-staining diplococci, staphylococci, streptococci in short chains.

CASE 12.—E. C.—, a bricklayer, aged thirty-five. He was first seen in June, 1910, with hoarseness of six months' duration. He had always been subject to coughs. He had been losing weight (13 st. to 9½ st. in one year). There was a history of pleurisy just before the hoarseness came on. On examination of the larynx there was extensive infiltration of the epiglottis, both ventricular bands were enlarged, the left arytenoid was swollen, and the right ulcerated. He was admitted to hospital, when his chief complaint was of dysphagia.

August 16.—The epiglottis was removed.

August 21.—The stump looked healthy and healed, and the left arytenoid was removed with punch forceps. Up to this time he had been kept in bed since admission, but was now allowed up for part of the day. Evening temperature 99° to 100° F., with fine crepitations over both apices and left base since admission. Tubercle bacilli were found in sputum.

September 5.—The temperature now remained normal, and he was up all day. The right arytenoid was punched out.

The patient remained until the end of July, when he was doing light work, and, according to the resident medical officer, was quite fit to do heavy work.

Pathological Report.—The specimen sent was an arytenoid, and shows a rough meshwork of fibromatous material, enclosing irregular masses of granulomatous material which contain giant-cell systems in all stages of formation. *In and around these giant-cells tubercle bacilli were found.* Besides the granulation-tissue there are patches of infiltration, which show lymphocytes for the most part. The epithelium is definitely affected, and down one side is becoming necrotic and ulcerated. There is definite irregular proliferation, especially marked at the apex of the arytenoid. Altogether this forms a very good connecting link between the cases of K. R.— and those of P.— and L.—, since in the former the epithelium has not yet been affected to such an extent, and in the latter the process has extended as far as almost complete necrosis and ulceration.

CASE 13.—L. H.—. The patient, an unmarried woman, aged twenty-five, was seen in the Consumption Hospital.

She had had hoarseness of several months' standing with cough and expectoration. There were well-marked signs of phthisis at both apices, and tubercle bacilli in the sputum. The right vocal cord was red, swollen and cylindrical, and there was a tubercular ulcer on its upper surface.

The patient was put on vocal rest in addition to general sanatorium treatment and tuberculin. In three weeks' time the swelling of the cord had much diminished and it was paler, but the ulcer remained and showed a tendency to spread. Three

applications of the cautery were then made to the ulcer at fortnightly intervals and the ulcer rapidly improved. A month after the last application it was completely healed.

At the present time, six months from the commencement of treatment, the larynx is normal except that there is a just perceptible scar in the position of the ulcer. She is in excellent health, the voice is perfect, and the chest arrested.

CASE 14.—J. B.—, May, 1911. The patient, a man, aged forty-five, was brought to the out-patient department of University College Hospital with urgent dyspnoea which necessitated an immediate tracheotomy. Subsequently the larynx was seen to be blocked by a movable pedunculated mass the size of a three-penny-piece, which was apparently growing from the left ventricle. The mucous membrane of the larynx was red and catarrhal, the left arytenoid was swollen, and there was a sprouting granulation in the region of the left vocal process. He was found to have phthisis with tubercle bacilli in sputum and a good deal of bronchitis, and was admitted to Mount Vernon Hospital, where the pedunculated mass was removed by the indirect method.

He could dispense with the tracheotomy tube for four or five hours, but not longer, and could not sleep without it. There was much irritation from the tracheotomy tube and a quantity of muco-purulent secretion. A Bruning's tube was passed under general anaesthesia as he was too intolerant for this to be possible under cocaine. It was then found that there were numerous subglottic masses. A very thorough clearance was made by means of Patterson's forceps, and the swollen left arytenoid was punched out. The patient's temperature, which had been normal, was raised for three days after the operation, but then fell, and he has been able to breathe comfortably and to dispense with the tracheotomy tube.

July, 1911.—He is now in good health, and the moist sounds have almost disappeared from the chest.

Giant-cells and tubercle bacilli were found by Dr. Butterfield in sections of the growths removed from the larynx.

CASE 15.—Miss B.—, She consulted me on January 10, 1910. She was aged thirty-five, and had had phthisis for nine years and worn a tracheotomy tube for two years. Tracheotomy had been necessary owing to the obstruction to respiration due to tuberculosis of the larynx. She was being treated by tuberculin.

On examination of the larynx the cords, which were pale and healthy, were nearly obscured by massive infiltration of the ventricular bands. The arytenoids were enlarged and the left oedematous. The tracheotomy opening was healthy and no discomfort was caused by the tube. As the disease had commenced to be active after a period of quiescence I advised galvano-cautery puncture. Five deep punctures were made at intervals. These resulted in fibrosis and the laryngeal condition quieted down, but although the voice remained good she was unable to dispense with her tube.

The signs in the chest were widespread but very chronic: tubercle bacilli could be found in the sputum from time to time.

When last seen in May, 1910, her health was fair, and she had not lost ground.

The larynx remained quiescent.

CASE 16.—G. J.—, The patient was an unmarried woman, aged thirty-three, who was seen in December, 1909, for cough, pain in the throat, shortness of breath, and occasional loss of voice. She had had slight hæmoptysis. On examination of the larynx she was found to have an irregular interarytenoid swelling and reddened and cylindrical vocal cords. The nares were narrow, and she had collapsed alæ nasi. There were two or three small polypi in each nostril. The

chest showed a dry cavity near the left apex. She had been in the hospital in 1907, when she was put down as having simple catarrhal laryngitis.

The nasal condition was treated, and the interarytenoid swelling was removed by cutting forceps in Mount Vernon Hospital in June, 1909, and proved to be a tuberculoma. The cords at that time showed superficial ulceration. Tubercle bacilli were present in the sputum.

The site of removal of the growth healed well, and the ulcer on the cords cleared up with vocal rest and sanatorium treatment. She was seen in October, 1909, when the larynx was arrested and her general condition very fair.

PATHOLOGICAL REPORT ON THE SPECIMENS SHOWN AT THE MEETING.

In the consideration of these twelve cases, which are typical examples of a much larger series, the most striking characteristic as a whole is the way in which they are seen to run quite insensibly from the one extreme type to the other end of the scale. Three of the cases are of especial interest in that the patients were the subjects of syphilitic infection as well as tubercle, but the points of difference as brought out by histological examination between them, and the cases of tubercle uncomplicated otherwise than by secondary infection with the ordinary pyogenics, are really very small, except that two of the cases were remarkable for the number of tubercle bacilli, which could be found with the utmost readiness. There is a marked tendency for the epithelium to be rather more severely affected where the general changes in the body of the epiglottis were not remarkable for their extent.

With regard to those cases where there were no grounds for thinking, from either bacteriological or clinical evidence, that there was any marked factor in the condition other than tubercle, one finds that it is possible to arrange the cases in a series with at one end of the scale involvement of the entire structure of the epiglottis, while at the other end we find those cases where the evidence as to the nature of the infection is by no means so clear. In the latter the lesions are apparently confined to one spot, and tubercle bacilli cannot be found, though by the method introduced by Much it is possible to demonstrate the presence of Gram-staining rods and granular material.

This latter class of case, where the pathological findings are exactly similar to those of old tuberculous infection in glands where tubercle bacilli cannot be found by ordinary methods, is clinically the class which shows a great tendency to assume a chronic course, and, with treatment, to recover.

On the other hand, there are the cases where the whole of the pathological findings lead one to the conclusion that they are cases of acute infection. The cases of P — and E. C — are extremely good examples of this.

Both of the specimens of these cases—the one an epiglottis, the other an arytenoid—show an abundance of tubercle bacilli and involvement of the entire thickness of the part removed by operation. Both of these patients became arrested under treatment.

Another consideration which forces itself on one in a survey of this series is that it is apparently impossible to divide these cases of laryngeal tuberculosis into "lupus of the larynx" and generalised laryngeal infection.

The transition from the lupoid cases to the other extreme is quite gradual and indefinite, and the occurrence of the epithelial changes associated with the lupoid condition is quite irregular in its distribution through the series.

H. G. BUTTERFIELD, M.A., M.D. OXON.

SOCIETIES' PROCEEDINGS.

BRITISH MEDICAL ASSOCIATION—SECTION OF
LARYNGOLOGY, OTOTOLOGY, AND RHINOLOGY.*Meeting at Birmingham, July, 1911.*MR. F. MARSH, Birmingham, *President, in the Chair.*

PRESIDENT'S INTRODUCTORY REMARKS.

Let me first of all extend a very cordial welcome to all members attending the Section and to our visitors from beyond the seas. I am sure we all very much appreciate the presence of the latter, some of whom have come great distances to give us the benefit of their knowledge and experience in the special subjects set down for discussion. The exchange of opinions and views cannot fail to be of mutual benefit, and I trust the visit will be a pleasant and profitable one.

Birmingham—soon to become, if only for a short time, the second city in the Kingdom—will, as a city of very many industries, doubtless possess some features of interest for every one. In the evolution of specialism it has been true to its motto, "Forward," for a hospital for diseases of the ear and throat was established some seventy years ago. The present building, providing accommodation for 41 in-patients, will, I think, compare favourably with that of any big city, and the record of clinical work done therein will also bear comparison. In one matter, however, Birmingham lags behind other large cities, in that there is no chair, nor provision for teaching these special subjects, in the University.

Owing to the multiplicity of industries, there is no one "trade" affection of the regions we are interested in peculiar to the city, nor, possibly from its position on a group of hills 400 to 600 feet above sea-level, is there any one predominant disease of these regions.

At the present time a question of grave importance, though perhaps much less so to consultants and specialists than to the large body of general practitioners, is that of the National Insurance Bill. As it at present stands, it will not much affect specialists from a monetary point of view—the class coming under the income limit will with few exceptions continue as heretofore to obtain special treatment at hospitals, but when compulsory payment has to be made for medical treatment, what is now given as a charity will ere long be demanded as a right. The State, following the path of least resistance, will probably attempt to meet this demand by subsidising hospitals. This is foreshadowed by Clause 17, which gives power to friendly societies to subscribe to hospitals, and which will probably be deleted, as the Chancellor of the Exchequer has decided not to deal with the hospital question at present. The question, however, will be dealt with, and if hospitals accept the subsidy, they will be brought gradually under State or municipal control.

It would almost seem that some State assistance will be needed unless the privileges now given are to be considerably curtailed, for it cannot be

expected that employers of labour and their employees will continue their subscriptions to hospitals on the present scale and at the same time pay insurance premiums, in most cases larger in amount than their present contributions. (Some £20,000 is now contributed annually to the Birmingham Hospital Saturday Fund by the class now to be insured.)

It therefore behoves the medical staffs, the majority of whom are consultants and specialists, to consider the position in advance and come to a decision whether a State or municipal subsidy, involving some control, should be opposed or supported, and if such subsidy and control is accepted or is unavoidable, what steps should be taken to ensure—

- (1) Satisfactory regulations for appointment of medical staffs.
- (2) Adequate representation of medical staffs on governing bodies.
- (3) Adequate payment of medical staffs (now honorary) for work done for the State.
- (4) The control of clinical teaching by medical staffs.
- (5) The restriction of the benefit of treatment to the class for whom it is intended.

To give effect to any decision the support of the whole profession is essential, and this can only be obtained through the one organised body of the profession—the British Medical Association. It is therefore important that all consultants and specialists who are not already members should join the Association, whether they personally will be affected or not. I think, too, that a representative committee of members of hospital staffs should be formed at an early date to formulate a policy and have it approved by the Association before further legislation on the lines forecasted is enacted.

This year our Section includes the trilogy of laryngology, otology, and rhinology, which to some may seem a retrograde step after their separation last year. I am rather disposed to think it an advantage, for although certain affections of the larynx and of the labyrinth are in no way due to conditions existing in the upper air-passages (the mouth, nose and pharynx), yet for many diseases this region is a ground common to both, and should be considered the centre point for both laryngologists and otologists. Both should be prepared not only to diagnose but to treat any causative lesion in these regions. It is difficult to credit Mr. Mark Hovell's story of the patient who had been treated by an aurist by inflation, whose nose was stuffed by polypi which had received no treatment whatever. Should a division eventuate, the rhinologist would undoubtedly hold the commanding and the most logical position.

I trust, however, the tendency to further cleavage will be checked, and that the time will not come for one operation or one method of treatment to be alone specialised in. Such an issue would be alike disastrous to the profession and the public.

A departure which will be watched with interest by all specialists is that recently made by ophthalmologists, who, at the instance of Mr. Doyne, have recently instituted at Oxford a diploma in ophthalmology, which is granted to medical men passing an examination in this subject after a special course of study. Should the diploma become the hallmark of ophthalmology, the advisability of taking a similar step will need consideration by specialists in our trilogy, especially as so little attention is given to these subjects by universities and examining bodies. The danger is that at some future time the diploma may be granted without the restriction of a prior qualification in medicine and surgery, which would ultimately result in narrowness of view and deterioration. A wide outlook is essential when many local symptoms have a constitutional

cause, and I believe that that specialist will be the most successful who has had a fair experience in the practice of general medicine and surgery before limiting himself to special work.

DISCUSSION ON THE TREATMENT OF TUBERCULOSIS OF THE LARYNX.

INTRODUCED BY DRs. DUNDAS GRANT, P. WATSON-WILLIAMS, AND
MR. G. SECOCMBE HETT.¹

Dr. W. JOBSON HORNE (London) had no hesitation in agreeing with the statement that although that Section of the British Medical Association had held many discussions on the treatment of laryngeal tuberculosis, the last word on the subject had not been said. He would go further, and state that the last word will not have been said until the all-important fact had been recognised—and widely recognised—and for some years, and had been acted upon, that in the matter of tuberculosis the larynx was a part of the lungs. It had been said that it takes twelve years for a scientific fact to become generally accepted. He had promulgated this opinion as far back as 1898. He was opposed to extreme surgical measures such as the amputation and the extirpation of parts of the larynx. If the earlier examination of the larynx in all possible cases of phthisis, even in those cases which presented no pulmonary symptoms or signs, were insisted upon, then extreme surgical measures would not be necessary. These views were not to be misconstrued into a tendency to nihilism on his part in the treatment of laryngeal tuberculosis, but they were to be accepted as a desire for conservation of the organ which they were called upon to treat. He based his opinion upon the results of his investigations into the development of the disease, and into the natural process of its arrest. These results were given to the Association as far back as 1898, when the Association met in Edinburgh. He now briefly summarised them as follows: (1) That when the larynx is infected with tubercle the disease is already established in the lung. Primary tuberculosis of the larynx is a negligible quantity. (2) That the disease in the larynx progresses *pari passu* with that in the lungs: when the disease in the larynx presents ulceration that in the lungs has advanced to cavitation; and *vice-versa* when that in the lungs has become arrested then that in the larynx heals. (3) That when the disease in the lungs is confined to the pure miliary form, the larynx is not infected. (4) That infection of the larynx takes place by the sputum from the lungs, through the opening of the ducts in the laryngeal mucosa. (5) That the regions of the larynx more prolific of glandular structure are more vulnerable to tuberculosis. (6) That the regions of the larynx covered with columnar cell epithelium are more prolific of glandular structure, and are more vulnerable to the disease than the parts covered with squamous epithelium. Hence the central part of the vocal cords becomes involved only by continuity and extension of the disease, and offers the greatest resisting power. (7) That the rational treatment is to preserve the mucous membrane covering the larynx and to induce a metaplasia of the columnar mucosa into the squamous variety—that is, to induce a condition of *pachydermia laryngis*. This is the natural process of arrest of the disease. The natural process of arrest can be induced and imitated by absolute rest of voice and the submucous puncture with a galvanocautery point. He considered that if these views were generally recognised,

¹ See p. 561 *et seq.*

and that if an early examination of the larynx were insisted upon, in fact if every resident medical officer of a sanatorium had expert knowledge in the technique of laryngology, then the extreme surgical measures which had been suggested to them would not be required. Several points of detail had been raised which the time at his disposal did not permit of his entering into. One was the method of anaesthetising the larynx for the purposes of operative measures such as the puncture of the galvanocautery. Another was the method of anaesthetising the larynx for the purpose of relieving dysphagia. Into these matters he hoped to enter more fully, and to bring before them methods which he had practised for many years. One was the method of using a laryngeal syringe for the application of cocaine. A new instrument he hoped to be able to bring under their notice in the course of the meeting was a simplified form of insufflator for the application of powders to the larynx and other regions.

Dr. TREVELYAN (Leeds) emphasised the importance of examining the larynx in every case of phthisis in order to detect the earliest cases of tuberculous laryngitis. He looked upon the prognosis of the ordinary (not early) case of tuberculous laryngitis as very serious. The early cases should be treated on open-air lines with tuberculin and by suitable local measures. He had rarely seen any real local improvement in the larynx, either as a result of the open-air *régime* or the use of tuberculin or of both combined. He had not obtained any good results from continuous inhalation or intra-laryngeal menthol injections. He had seen considerable and long-lasting improvement follow upon tracheotomy in a few exceptional cases of stenosis in laryngeal phthisis. In regard to palliative treatment, he found that the bolting of eggs was a useful method of feeding in painful deglutition. Dr. Trevelyan was in favour of judicious endo-laryngeal treatment in early laryngeal phthisis in the hope of cure, and also with the object of preventing the distressing symptoms of the advanced disease.

Dr. MORITZ (Manchester) said: In regard to the therapeutic measures which we may adopt for their treatment, as well as in regard to the way in which they are likely to be influenced by treatment of any sort, we may distinguish four forms of laryngeal tuberculosis, namely, (1) tuberculous infiltrations covered by an unbroken mucous membrane, (2) superficial erosions and ulcerations, (3) deeper ulcerations, (4) tuberculonata. The first form will naturally resist the therapeutic influence of externally applied antiseptics or paints. We do not know of any agent which will act through the unbroken mucous membrane and destroy the underlying tuberculous deposit, and it seems to me inadvisable to diminish or destroy the natural resistance which the mucous membrane offers to the tuberculous process by the application of caustics such as lactic acid, chromic or trichloroacetic acid, or of the galvanocautery, either as a flat burner, or, as Grünwald recommends, by galvano-puncture. I have tried this latter method repeatedly, but I have, I am sorry to say, several times seen the "closed tuberculous deposit" convert itself into an open ulcer, particularly when the tuberculous infiltration, as usual, was situated in the inter-arytenoid space. I therefore consider the tuberculous infiltration with unbroken mucous membrane as a "*Noli me tangere*," and my plan is to treat it by ordering complete silence, prohibiting speaking as well as whispering, combining with this sanatorium treatment. In many cases we thus see the swelling gradually, though slowly, disappear, provided the tuberculous process in the lung is not too far advanced. A few cases of this sort treated by

small injections of tuberculin, with or without the observation of the opsonic index, have also done well, but I can scarcely say that they did better than those who received no tuberculin injections. In regard to Groups (2) and (3) the treatment we adopt for the larynx has to depend greatly upon the general condition of the patient and the state of the accompanying pulmonary affection: failing strength, high fever, far advanced or rapidly spreading pulmonary phthisis prohibit all operative procedures excepting those for the relief of urgent laryngeal dyspnoea or dysphagia. Larger operations should be undertaken only in cases where the general condition permits us to hope that by a cure of the local condition a prolongation of life may be attained. In regard to Group (2) — superficial erosions and ulcerations — these form a grateful field for the application of various therapeutic measures. I have seen such ulcerations frequently heal after the application of Whitehead's varnish — a preparation of iodoform, friar's balsam and collodion with which Whitehead used to swab out the oral wound after excision of the tongue. I have also found "pyoktatin" (arsenic free methylene-blue) useful. The application of this drug was very much praised at the Laryngological Section of the International Congress in Berlin twenty years ago, but since then it has gradually fallen into oblivion — I think undeservedly so. I have found both Whitehead's varnish and pyoktatin useful, provided they are applied frequently — at least three or four times daily. Of course, this can only be done when the patient is in a hospital under the care of a resident laryngologist. The patient has at the same time to keep silent. Only when cases do not heal with this treatment I recommend the application of lactic acid or trichloroacetic acid, after previous cocaineisation of the larynx, or, if these fail to be successful, the galvanopuncture. Unfortunately, it is absolutely impossible to say whether the case is going to do well. This depends, as before mentioned, upon the general condition, and also upon the local vitality and power of resistance of the mucous membrane, the latter, again, being possibly dependent upon the fact as to whether there exist tuberculous foci in the submucous or deeper layers of tissue covering the laryngeal cartilages. These may be present without any obvious macroscopical signs. The accurate pathological and microscopical examination of larynges removed from patients who have died from tuberculosis shows this. The deeper deposits, as well as the open, deep ulcerations with undermined edges and with more or less general infiltration or oedema of the surrounding tissue, give, in my opinion, a bad prognosis — they fall into Group (3). One may, if the general condition is good, try whether scraping and curetting according to Heryng's method, with or without the consecutive application of the galvano-cautery, will influence them beneficially. One will thus be able to produce an apparently more healthy surface, but in most cases within a short time this will become reinfected, and thus a small ulcer will become converted into a larger one. Thus in these cases our first maxim should also be, *nol nocere!* When there is much pain a spray of a 20 per cent. solution of antipyrin, with 10 per cent. eucaine lactate, which I recommended more than twenty years ago, helps to clear the sloughing surface and relieves the pain more effectually and for a longer period than eucaine or cocaine alone, or orthoform or amethesin, etc., do. As for Group (4), it seems to me that tubercle-mata should be removed by cutting instruments, with or without the consecutive application of the galvano-cautery. I have not come across any cases with far advanced laryngeal ulceration and such slight pulmonary symptoms as to justify laryngotomy, and therefore cannot speak from my own experience

in regard to the operation or its success. Of sixty-four such cases collected by Grünwald, 27 per cent. died soon after the operation, 46 per cent. died shortly after from the lung affection, and 8 per cent. only remained well for a longer period.

Dr. ANDREW WYLIE (London) said: The previous speakers have discussed most of the points in connection with this disease, and Dr. Horne has, as usual, detected the weaknesses in the debate, but I may mention to Dr. Horne that laryngeal syringes are always used for anæsthetising the larynx, and I would suggest never to use a glass syringe but Mendl's. For dysphagia several methods of relief have been advocated by Dr. Grant, such as Leduc's for the inhalation of powders and injections of eucaine and alcohol into the superior laryngeal nerve with great success, but the method of placing your patient on a table, lying on his chest, and his head over the table and sucking soft food through a tube, is excellent. I agree with Dr. Williams that moist climates are the best for tuberculous patients, especially laryngeal tuberculosis. Patients seem to improve when sent to the moorlands in this country more than the dry air of Switzerland or Africa. Dr. Grant mentioned the treatment of any nasal affection. Before any results can be got in treating a laryngeal affection, polypi, septal obstructions, rhinitis, sinus suppurations, and adenoids must be removed. With all these methods of treatment surgically and medically I believe that the right thing, and one of the most difficult, to do, is a masterly inactivity—in fact, no treatment at all. This is not easy to perform when the patient and the friends are pushing the surgeon to do something. If we had the courage of our opinions we would perform tracheotomy in all these cases, and then we would be sure of rest to the larynx. One of the best local treatments of a mild character is daily laryngeal injections of phenol, menthol, and paroline. After the patients have got educated to this injection, the nurse can perform it after Mendl's style. These forms of injections do not irritate the larynx, the phenol acting as an anæsthetic. Rest to the larynx, moorland air, and practically no real active treatment is what my experience has found to be best.

Dr. DAN MCKENZIE (London) agreed that the method of treating laryngeal tuberculosis should be one of considerable inactivity. He was averse from surgical measures unless in cases where an epiglottic or arytenoid ulcer interfered with swallowing. He had had considerable success after the galvano-cautery puncture of the larynx in certain cases, and had been surprised by the benefit upon the laryngeal disease after restoring physiological patency to an obstructed nose.

Dr. PEGLER (London) supported Dr. Dan McKenzie as to the importance of clearing the nasal passages of serious obstruction to breathing in cases not only of laryngeal but also of pulmonary tuberculosis without laryngeal complications. Of such cases as he had he could report definitely good results. The cases must, of course, be selected, and if the tuberculous infection was not in too advanced a stage, the healing of the tissues was not necessarily slow, but, of course, the submucous resection of the septum with its conservative treatment of the mucous membrane was always to be preferred—supposing, too, the fault of the obstruction lay with the septum. Dr. Trevelyan had mentioned good results from tracheotomy in laryngeal tuberculosis. The speaker had adopted this procedure in cases of severe dyspnoea or dysphagia many years ago, but the effect seemed to have been to shorten life very considerably, and he had, therefore, quite given up the operation. No doubt, however, under the present more favourable conditions of sanatorium life the case would

be altered, and far better results obtained. He always had understood, however, that the prognosis as to life in tracheotomy for laryngeal phthisis was not good. Dr. Pegler recalled the discussion at the Cheltenham meeting, which some members sitting near him would well remember. It appeared to him that the discussion as to the active or non-active treatment of laryngeal tuberculosis is now, as then, very much divided into two camps, leaving the general position practically the same.

Dr. N. C. HARING (Manchester) said: The general treatment of phthisis includes that of laryngeal tuberculosis, leaving very little scope for surgical interference, which should be entirely limited to circumscribed lesions, the removal of which may be undertaken to give relief but with no idea of cure. The special additional treatment of a phthisical patient who suffers from laryngeal tuberculosis in addition to the usual treatment consists in the enforcing of voice rest and soothing of irritant cough. The presence of mixed infections must be clearly kept in mind: streptococci, staphylococci, and spirochaetes may be present in addition to tubercle bacilli, and the use of anti-syphilitic treatment often clears up some of these mixed infections with marvellous celerity. Tuberculin treatment has in my hands been of use in certain cases; in two or three of the cases in which the laryngeal condition was much improved the lung condition at the same time steadily deteriorated. It is of little use to indulge in surgical work on a larynx in a moribund patient, and in most of the cases where interference more than that of the slightest character is entertainable the condition of the lungs forbids it.

The PRESIDENT (Mr. FRANK MARSH), in summing up the discussion, said that there was great unanimity in favour of conservative measures, such as rest of voice, removal of local sources of irritation, general therapeutic, sanatorium and climatic treatment. It was also generally agreed that a moist climate was preferable to a dry one. There was naturally some divergence of opinion upon the value of the different methods of local treatment. Clearly no one method could be exclusively followed: each case must be treated by that which seemed most suitable for it. The galvano-cautery, galvano-puncture, linear incisions, submucous injections—each had their advocates, especially the galvano-cautery. There was divergence of opinion as to the value of tuberculin, and also on the question of removal of the epiglottis, but the cases related and the results obtained by Mr. Seccombe Hett showed that this procedure was of value in properly selected cases: it seemed important there should be no fixation of the larynx, otherwise considerable difficulty in swallowing would follow. The importance of early diagnosis was strongly emphasised by all. He thanked the introducers for the very able and broad-minded way in which they had dealt with the subject.

REPLY.

Dr. DUNDAS GRANT agreed with Mr. Hett as to the almost magical relief from pain afforded by the removal of the epiglottis in appropriate cases. In those cases of his own in which the regurgitation of liquid into the larynx seemed afterwards to become more marked, it was probably because there was already considerable destruction of the rest of the framework of the larynx. He had also found relief follow the punching out of the arytenoid swelling by Gouguenheim's method, but he hesitated to interfere so extensively with the anatomy of the part. He was pleased to have Dr. Horne's corroboration of the excellent effect of silence, and he noted his recommendation as to the purposive use of

adrenalin for the differentiation of oedema from tuberculous infiltration. In some of his cases, however, portions of what he took to be simply oedematous tissue proved when removed by means of punch forceps to be genuine tuberculous infiltration. In one case, a well-marked oedema, however, in which a pure culture of streptococci was obtained, the oedema subsided and left behind it a typical tuberculous infiltration. This might have been identified earlier if adrenalin had been used; it was obviously a case of secondary mixed invasion. He was surprised that Dr. Trevelyan had been so disappointed with the results of the continuous respirator; he thought it possible that he might have used too much menthol. He was interested in hearing that for non-continuous inhalation Dr. Trevelyan found a 10 per cent. solution of menthol in spirit valuable. The speaker's own experience was, in the cases in which he had done tracheotomy, that the lungs generally underwent speedy deterioration, but there were certainly cases in which tracheotomy was beneficial so long as the tube had not to be permanently retained. In reply to Dr. Moritz, he thought that in some of the cases in which operation on the infiltrated tissue had converted a closed ulcer into an open one the ulcer was already present, though concealed by the infiltrative swelling. He was very interested that Dr. Moritz found pyoktamin useful; the speaker had found it of the greatest value in the treatment of tuberculosis of the middle ear. He agreed with Dr. Wylie as to the value of intra-tracheal injections of mentholised oil; he made it almost a routine method of treatment. Also with Dr. Pegler as to the importance of removing nasal obstructions, and he explained Dr. McKenzie's difficulty by the polymorphous nature of the disease which presented itself in different types in different men's experience. Dr. Haring's statements were extremely weighty, but the speaker urged a greater tincture of optimism. The combination of syphilis and tuberculosis was not infrequently seen, and a number of cases supposed to be tuberculous, which had recovered under potassium iodide and mercury, were possibly of this nature. He had seen cases which confirmed Mr. Marsh's opinion as to the choice of climate, and quoted a case illustrating it. He had no doubt as to the usefulness of tuberculin, but it was most important to be on the look-out for any excess of reaction, whether from further auto-inoculation or other causes. He again wished only to say that the prognosis of laryngeal tuberculosis had immensely altered for the better since he first began to study the disease some thirty years ago.

Dr. WATSON-WILLIAMS, in reply, said: Dr. Trevelyan spoke of cases of laryngeal tuberculosis being in his experience severe and grave cases, and considered the prognosis in the face of laryngeal involvement as almost invariably bad. This is certainly opposed to my experience. I do not regard mere laryngeal involvement as in any way necessarily adding to the gravity of the patient's outlook; many a patient whose larynx is free goes down before the progressive lung disease, though truly the larynx generally becomes involved before the patient succumbs. But I would emphasise the importance of recognising as true though early laryngeal tuberculosis those early manifestations on which Dr. Jobson Horne has thrown so much light. In reply to Dr. Wylie I would say that "masterly inactivity" a term which I used myself at Cheltenham is all very well, and though in most cases it is, I think, the best method of dealing with laryngeal complications, it is a motto that some of us carry too far, and we only weaken the *laissez faire* attitude by a refusal to recognise the value of local treatment in selected cases. And I would like finally to add that I see no reason why a tuberculous patient should be denied the

relief that follows restoration of nasal respiration. The occurrence of tuberculosis is, I believe, sometimes determined by the evil effect of nasal obstruction on respiration, and when we see the immense improvement that follows restoration of physiological respiration in the non-tuberculous patient, it is a strong reason for affording the tuberculous subject those advantages in which he is in sore need.

Mr. Herr, in reply, said that he had deliberately chosen that most serious type of laryngeal tubercle—that is, that in which the epiglottis was involved, for the purposes of demonstration and discussion. There was little doubt among laryngologists experienced in the treatment of laryngeal tubercle that simple vocal cord lesions, or those affecting either the ventricular band, arytenoid or interarytenoid space alone, could often be arrested if the chest condition were favourable, but he wished also to show that they were not justified in adopting a *laissez faire* policy in the more serious types. He had been impressed by the unexpectedly favourable results which he had obtained by adopting radical measures in some cases of the more severe and widespread lesions. An epiglottic lesion was generally associated with disease of other parts of the larynx, and after removal of the former, local treatment, such as cauterization, etc., was often able to cause arrest of the remaining disease. He thought it would generally be felt that an ulcerated epiglottis associated with disease of ventricular bands, vocal cord, and arytenoid, together with disease of both apices, a raised temperature, and a profusion of tubercle bacilli in the sputum, would justify the worst possible prognosis, and yet one of the cases—a naval officer—was able to be on active service within a year from the commencement of local and general treatment. Cases such as this—and this was not an isolated example—forced one to the conclusion that one was not justified in standing by without attempting to prevent the inevitable termination of an early and distressing death. Even if only a small proportion obtained permanent relief, it must surely be the right thing to give the patient a chance of arrest. With regard to temporary benefit, there could be no doubt as to the relief of dysphagia by surgical measures, and further, it was remarkable how well the cut surfaces healed, even in severe cases, if a thorough and surgical removal were adopted. An interesting point had been raised with regard to the diagnosis between tubercle and syphilis of the larynx. He had seen cases of phthisis with infiltration of the epiglottis or ventricular bands in which the diagnosis had been difficult to make, and which had only been established by the appearance of specific lesions elsewhere, or by the result of anti-specific treatment. He thought that some spontaneous cures, especially of infiltrations of the epiglottis, could be accounted for by the fact that they were specific. In other cases there was a mixed infection. Two cases of the series were interesting in this connection—one that of F. S.—. In this case the laryngeal condition cleared up under potassium iodide. The patient was subsequently readmitted, as the epiglottis began to ulcerate. On removal and on cutting sections of the latter, tubercle bacilli were demonstrated. The other case, that of G. P.—, who developed syphilitic lesions while under treatment: His larynx was infiltrated, but there were no tubercle bacilli in the sputum or definite signs in the chest. It was thought that the epiglottis was tuberculous and it was removed. Sections showed that it contained tuberculous giant-cells and tubercle bacilli. The last point he would draw attention to was that tuberculous patients should be operated upon under good sanatorium conditions. The results of operation for tubercle of the larynx in out-patient departments were generally disappointing.

AUSTRIAN OTOLOGICAL SOCIETY.

*May 29, 1911; Monats. f. Ohren., year 45, No. 6.*PROF. URBANTSCHITSCH *in the Chair.**Abstract of the Proceedings.*A CASE SHOWING VARYING RESPONSE TO BOTH CALORIC AND
ROTATION TESTS.

BY DR. ERNST URBANTSCHITSCH.

A boy, aged seventeen, blind from his first to his third year, had suffered since the age of six with a bilateral aural discharge commencing on the right side, on which the otorrhea was constant, whilst on the left it occasionally subsided. The radical operation was performed on the right side in December, 1910, together with ligation of the jugular, and a like treatment on the left side in January, 1911. The interest of the case centred around the functional condition of the vestibular apparatus, which was present on both sides although the hearing was depreciated. Before the operation the nystagmus in response to rotation, although weak, was equal, whilst no effect whatever was obtained to the caloric test. After the operation a response to the caloric test could be elicited, but no nystagmus could be detected after rotation although during rotation it could be observed. Nothing could be seen on inspection to account for this condition, but Fröschels referred to an account of a similar case in the *Annales des Maladies de l'Oreille*, where the author considered that the horizontal canal alone must have been destroyed.

TWO CASES OF ONE-SIDED DEAFNESS AFTER SALVARSAN.

BY DR. O. BECK.

CASE 1.—Rash first appeared at the end of January, 1911. Examination proved a normal condition of the ears. February 1, intra-muscular injection; Wassermann, March 15 and 28 negative. Patient then began to notice loss of hearing. April 4, examination showed—left ear normal, right ear Cv at one metre, whisper at 10 cm. May 5, symptoms of acute destruction of the right labyrinth appeared, deafness being absolute and the vestibular apparatus completely unresponsive; Wassermann negative. May 10, in addition facial paresis noted. April 12, intra-venous injection; complement negative. Six days later the facial paresis was much improved, the vestibular apparatus definitely but very slightly responsive; deafness absolute. April 27, another intra-venous injection. No further improvement up to date. Serum reaction still negative.

CASE 2.—January 16, first appearance of rash. January 23, intra-venous injection; hearing normal. February 4, intra-venous injection. About the middle of March patient noticed some deafness and examination on April 3 showed both vestibules responsive, but total deafness on the right, whilst the hearing on the left was reduced to Cv at one metre. Lesion of the internal ear type; Wassermann negative. April 24, urine contained arsenic, Wassermann negative, aural condition unaltered.

Dr. O. MAYER had seen similar symptoms in two cases of lues in whom salvarsan had not been used. The negative Wassermann reaction in these cases of Beck's, however, suggested that these lesions were not due to syphilis. It was most important to determine what symptoms were dependent on salvarsan and what on the disease. Beck could offer no definite statement as to the relation of such symptoms to the exhibition of salvarsan, but merely submitted the fact that since the use of this drug more cases of labyrinthitis and affections of the cochlear nerve were observed than under treatment by mercury.

ANOTHER CASE SHOWING "COMPENSATION" TO ROTATION NYSTAGMUS.

BY DR. E. RUTTIN.

A woman, aged thirty-seven, who had had a chronic suppurative discharge from the right ear since childhood, had been for some time suffering with vomiting, giddiness and headache. Polypi said to have been removed on two occasions. Right side totally deaf, no caloric response, but the after-nystagmus following rotation both to the right and to the left was of almost equal duration. For this reason Ruttin diagnosed long past destruction of the labyrinth and expected to find the wall of the labyrinth much involved at the operation, during which procedure, indeed, the promontory was seen to be much flattened and no signs of the oval window could be detected. The case, in conjunction with other similar ones previously noted, served to illustrate the fact that the occurrence of such compensatory nystagmus enabled one to diagnose a long past and complete destruction of the labyrinth.

A TEMPORO-SPHENOIDAL TUMOUR AFFORDING SYMPTOMS OF AN AFFECTATION SITUATE IN THE LEFT POSTERIOR CRANIAL FOSSA.

BY DR. E. RUTTIN.

As the presence of a cerebral tumour was suspected a man had been examined by both Ruttin and Beck, who, however, except for a very small depreciation of hearing on the left side and a very slight symmetrical nystagmus, could find nothing from an otological point of view to confirm such a lesion. Shortly afterwards a coarse horizontal and rotatory nystagmus to the right was noted combined with a vertical downwards directed nystagmus. Left ear totally deaf; a very obvious difference in the caloric response on the left side, whilst the duration of the after-nystagmus with rotation to the right was thirty-five seconds and with rotation to the left forty-five seconds. Pointing reaction both before and after irrigation and rotation were normal. As the neurological finding also pointed in the same direction Ruttin diagnosed the presence of a tumour in the left posterior cranial fossa. The patient died very shortly, and at the *post-mortem* a large tumour was found in the left temporo-sphenoidal lobe.

BILATERAL OR MEDIALLY SITUATED TUMOUR INVOLVING THE EIGHTH PAIR OF NERVES ACCOMPANIED BY EXCESSIVE IRRITABILITY OF BOTH VESTIBULAR APPARATUS.

BY DR. ERNST URBANTSCHITSCH.

A man, aged sixty-five, who for some twenty-five years had suffered from a nervous disease and deafness and lately from increasing attacks

of giddiness, was sent on from the eye clinic with the report that he had optic neuritis. Aural examination: Tympanic membranes normal. Loudest shouting only heard a.c. on either side. No spontaneous nystagmus. Cold water irrigation produced an enormously strong nystagmus on the right side in 35" and on the left side in 20", which increased directly the irrigation was stopped, that is, directly the nystagmus appeared, and lasted some minutes. Nystagmus so induced to the left persisted even for 100" when cold water irrigation was applied to the left ear, when a period of rest occurred for 5" and then a right-directed nystagmus appeared, the patient becoming quite delirious during this test. Simultaneous irrigation of both ears evoked after the use of 700 c.cm. of water a trace of rotatory nystagmus to the right accompanied with some giddiness. Two slow rotations either to the right or left produced a brisk reaction, *i. e.* nystagmus to the same side during rotation followed by nystagmus to the opposite side accompanied with giddiness on stopping. On account of the condition of the patient galvanic tests were not tried. It was of great interest to note that in spite of the extreme irritability of each organ separately that, during simultaneous irrigation, the sense of equilibration was preserved, an observation which Urbantschitsch stated has not hitherto been made.

Alex. R. Tweedie (Trans.).

Abstracts.

NOSE.

Officer, D. McM.—**Deviations of the Nasal Septum.** "Australian Medical Journal," August 12, 1911.

Officer mentions that nasal obstruction in children is sometimes due to septal deformity, and that cases which have been operated on two or three times for adenoids without relief are remedied by an operation on the septum. The submucous resection is the best operation, but sometimes cannot be carried out on children when the Asche is substituted. Developmental errors account for more cases than traumatic causes. The effects of nasal obstruction are described. Local anesthesia only is used in performing submucous resection. A square or crescent-shaped muco-perichondrial flap, which can be turned back before incising the cartilage, is formed. The flap is turned back, and a double crescent incision made in the cartilage. The piece is now pulled off the opposite muco-perichondrium; this facilitates separation, and lessens risk of perforation. Particular attention must be paid to the removal of bony parts near the floor of the nose. Before separating the periosteum from the maxillary crest it is necessary to carry an incision along the upper border of the same. It can then be peeled off the bone without severing its connection with the muco-perichondrium. When the operation is complete a dressing of vaseline gauze is applied. This is left in only a few hours.

[Ref. has found Dr. von Burdleben's *Bismuth Bandbinde*, designed for dressing burns, an ideal intra-nasal dressing. It can remain in the nose two or three days, thus securing the flaps in position.

A. J. Brady.

Thompson, John A.—**Bone Cyst of the Ethmoid Cells.** "Laryngoscope," March, 1911, p. 152.

The patient, an adult female, had a serous discharge, when stooping, from the right nostril for some months. Her nose presented the appearance of atrophic rhinitis, and there was a perforation in the anterior portion of the septum. Both antra were clear on transillumination. On curetting the right ethmoidal region a cavity was entered, and it was found that the whole ethmoidal labyrinth had been converted into a cavity lined by a smooth shining membrane. All trace of partitions dividing the cells had disappeared. The discharge continued for about two months, and then gradually ceased without the lining membrane having been removed.

John Wright.

Freudenthall, Wolff.—**The Therapeutic Value of Radium in the Treatment of Diseases of the Upper Air-tract.** "Ann. of Otol., Rhinol., and Laryngol.," vol. xx, No. 1, p. 1.

An illustrated account of ten cases of epithelioma of ala nasi, osteo-sarcoma of maxilla, epithelioma of tonsil, lympho-sarcoma of nasopharynx, and carcinoma of larynx treated by radium, with good result.

MacLeod Yearsley.

MacKenna, R. W. (Liverpool).—**Ionic Medication.** "Brit. Med. Journ.," October 14, 1911, p. 888.

In the course of a discussion on ionic medication at the Birmingham meeting of the British Medical Association, Dr. MacKenna reported good results from treating lupus with zinc. The difficulty hitherto experienced in effecting the penetration of the zinc ions is due to the layer of epithelium covering the lupus nodules. A solution of liq. potassæ rubbed over the hypoid surface, however, dissolves the epithelial layer. After wiping off the alkali, a thick pad of cotton-wool saturated with 10 per cent. zinc sulphate solution is applied to the part and the zinc electrode connected with the positive pole is firmly held over it. Sitzings of from ten to twenty minutes once a fortnight were sufficient to bring about cure with a smooth elastic scar. It possessed an advantage over the Finsen light treatment in being applicable to intra-nasal lupus.

Dan McKenzie.

Noon, L.—**Prophylactic Inoculation against Hay-Fever.** "Lancet," June 10, 1911.

The author states definitely that hay-fever "is caused by a soluble toxin found in the pollen of grasses." Idiosyncrasy exists in those who suffer from it and can be demonstrated by dropping extract of grass pollen into the eye. The history of the development of treatment by a serum, such as pollantin, is given briefly. Such treatment is, however, unsatisfactory, and therefore experiments were undertaken by the author to study the reactions of hay-fever patients towards inoculations of pollen toxin. The plan was to obtain a numerical measure of the sensitiveness of the patients to the pollen toxin and to observe whether this was increased or decreased by subcutaneous inoculations of various quantities of pollen toxin. The extract used was made by Dumbur's method from grass pollens of different species. The most active was that of Timothy grass (*Phleum pratense*). The result of the experiments so far is to

show that the sensibility of hay-fever patients may be decreased by properly directed dosage at least a hundredfold, whilst excessive or too frequent inoculations only serve to increase the sensibility. It remains to be seen how long immunity will last, and the author has patients under observation who have undergone treatment for periods varying from a few weeks to eight months. *MacLeod Yearsley.*

Baumgarten, Egmont.—Impairment of Vision due to Intra-nasal Conditions. "Monatsch. f. Ohrenh.," Year 45, No. 6.

Referring to his previous article under the same title—an abstract of which was published in the JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY, March, 1911, pp. 160-3—the author now adds an account of four more similar cases to the six there described. All were sent on to him from the eye clinic. In these cases, as he observed in his previous report, it is unusual to find definite empyemata (probably because under these circumstances the rhinologist would have been consulted by the patient in the first instance)—though, if any such condition be discovered, it should, of course, be submitted to radical treatment. Failing this the author's mode of procedure is to remove enlarged middle turbinals, or, if no intra-nasal abnormality be detected, to apply adrenalin and cocaine to this area and note if any improvement at once occurs. In "many" instances this immediate improvement does occur, and it is then his practice to remove the middle turbinal and open the ethmoidal cells, and again later, if there is still reason to suspect that it may be advisable, to expose the sphenoidal sinus.

CASE 7.—Papillitis chronica. Vision both eyes $\frac{5}{60}$, central colour scotoma. Sight of the right eye failing many weeks. Both middle turbinals lay almost in contact with the septum; the right was therefore removed and the sphenoidal sinus opened, which, however, was found to be "empty, but the mucous membrane much swollen."

Within half an hour the oculist reported that the colour scotoma had disappeared. On the third day after vision, both sides, was $\frac{5}{60}$; on the fifth day, $\frac{5}{7}$, and No. 5 type could be read. The papillitis still persisted, but after fourteen days was much improved.

CASE 8.—Neuritis retro-bulbaris. Vision right $\frac{5}{60}$, left $\frac{5}{3}$. Central colour scotoma on the right side and "in a slight degree" also on the left. Fundus normal in appearance. As the anterior end of the right middle turbinal was the seat of a small cystic enlargement it was resected. "Immediately" after the operation the colour scotoma on the left had disappeared whilst that on the right was scarcely recognisable; vision right " $\frac{5}{7}$?". After a few days the patient was lost sight of, "but must have felt well, otherwise he would have reported himself to the oculist who was also his club doctor."

CASE 9.—Neuritis acuta. A girl, aged twenty, was sent to the author in November, 1910, with the report: Vision—right, $\frac{5}{7}$; left, $\frac{5}{15}$, left neuritis acuta, central colour scotoma for red and green; three weeks ago influenza, severe headache; last six days vision in the left eye becoming worse daily.

With the exception of a bony enlargement engaging the septum about the centre of the left middle turbinal, the mucous membrane over which was normal, no abnormality was detected on intra-nasal inspection. This swelling was resected and its interior found to be filled with granulations and its mucous membrane oedematous. On the fourth day after the

vision was $\frac{5}{7}$ and the colour scotoma gone. On the tenth day the vision was $\frac{5}{8}$, the inner margin of the papilla was indistinct and was still so by the end of January as some neuritis was still present.

CASE 10. — Neuritis acuta. A young man who, in December, began to suffer with left-sided headaches and within five days completely lost the sight of the left eye, presented himself with the following report from the oculist: Almost absolute central scotoma left side, cannot see the hand before his eyes but only the finger-tips; axillary neuritis; the papilla is red and its margin indistinct.

The left middle turbinal was much swollen and the middle meatus filled with pulsating pus. Acute purulent ethmoiditis was diagnosed, the frontal sinus being probably similarly affected, as transillumination showed this side much darker although no tenderness could be elicited over it. After the application of cocaine and adrenalin to the middle turbinal and its neighbourhood, the patient already stated that he could recognise light in the left eye. The middle turbinal was at once removed and the ethmoidal cells opened up. After the operation vision $\frac{5}{10}$, headache gone and did not recur. The third day, vision $\frac{5}{10}$; the fifth day, $\frac{5}{7}$; no scotoma could be detected and the neuritis had completely disappeared. By February the vision was $\frac{5}{8}$, and since January all discharge had stopped.

The very rapid and complete cure of this case was a most gratifying surprise, says Baumgarten, both to the oculist and himself, and quite eclipsed anything either of them had seen.

In conclusion he adds that he has since seen a "number" of similar cases which he has been able to either cure or considerably improve, and he urges very strongly that a very careful watch should be kept for such conditions and their recognition met with prompt intra-nasal treatment.

[The article is perhaps principally worthy of note in relation to the discussion which followed Prof. Onodi's paper this summer at Birmingham, where the very frank expression of opinion on this subject and the personal experience of most members were certainly somewhat at variance with the most satisfactory results as described by Baumgarten. This report should be read in conjunction with its predecessor or the two original articles should be studied together. An endeavour has been made to represent the paper without bias, but it is obvious that many points arise on which further information would be desirable before one can unreservedly associate oneself with the author's sanguine conclusions, whilst the last case should not be included in the same category as that of the previous three here reported. The account would further command much more reliance were it leavened with the relation of but one *unsuccessful* case, for such indeed, occasionally at any rate, do occur.

Alce. R. Tweedie.

MOUTH AND PHARYNX.

O'Meara, J. M.—Note on a Case of Adenoids Associated with Albuminuria and Casts in the Urine. "*Lancet*," May 6, 1911, p. 1204.

Boy, aged seven, with marked adenoid symptoms, in whom was found a very large number of casts and a quite small quantity of albumen. Very marked improvement set in immediately after removal of the adenoids.

so that there was more improvement in the three days after the operation than in the three weeks preceding it, when he was kept in bed on a milk diet. The casts were epithelial, granular, hyaline and blood, with renal cells and red blood-corpuscles.

MarLeod Yearsley.

Guyot, F.—General Anæsthesia in Operations on Tonsils and Adenoids.—*"Revue Méd. de la Suisse Romande"* July 20, 1910.

Dr. Guyot thinks that ordinary tonsillotomy, performed with the guillotine, is not painful, or at any rate not painful enough to justify the use of a general anæsthetic; and the same may be said of curetting adenoids. The adenoids themselves contain very few nerves and the bulk of the pharynx is very insensitive. Therefore as a rule tonsillotomy and curetting of adenoids can be performed quite successfully, and ought to be performed without general anæsthesia. Only when a child is intractable or is very delicate or nervous ought a general anæsthetic to be used. Ethyl chloride is the safest and in every respect the most convenient general anæsthetic to use, and should be administered in the mask designed by Dr. Camus.

Arthur J. Hutchison.

Burack, S. M. (Charkoff).—Cases Illustrating the Complications met with after Removal of Adenoids and Tonsils. *"Zeitschr. f. Laryngol."* Bd. iii, Heft 5.

The paper is the result of an experience of 2000 cases; 3 per cent. of the patients were middle-aged and three individuals were over fifty years. Dangerous hæmorrhage occurred on three occasions; in the first of these Mikulicz's compressor was used, in the second case the hæmorrhage stopped when the patient fainted, while in the third prolonged digital compression was successful in arresting the bleeding. Mathieu's tonsillotomy was used in every case. Out of 1500 cases of adenotomy there were five with severe hæmorrhage. In the first post-nasal plugging was carried out; no cause could be found for the bleeding, but Burack suggests that the knife may have been too sharp (!). In a second case the hæmorrhage ceased when a tag was removed. Other complications were: Injury to uvula; slight septic infection; seven cases of purulent otitis media, as a rule in children suffering from purulent rhinitis; catalepsy; laryngeal spasm; paresis of soft palate; peritonsillar abscess; loss of teeth.

J. S. Fraser.

Labourè, Jules (Amiens).—Respiratory Re-education of Adenoids. *"Arch. Internat. de Laryngol., d'Otol., et de Rhinol."* March-April, 1911.

Respiratory exercises should first be short. After a certain number of exercises have taken place the more freely moving parts of the thorax may be partly immobilised by an elastic band for the purpose of enabling the more inert parts to participate in the action. The breathing exercise should take place through the nose and in the recumbent posture while the patient is relieved of all tight clothing. (1) Simple respirations unaccompanied by movements. The patient is requested to fill the chest, then to empty it while the thorax is compressed. These movements at first are somewhat fatiguing, and later, when less so, should be performed in the standing, sitting and kneeling positions. (2) Later, respiration is performed while massive movements of the arms and trunk are made, these movements somewhat resembling those made in artificial

respiration. The same movements are then gone through in the upright posture. (3) Active movements follow combined with the deep respiration; the movements of Swedish gymnastics are here suitable. Later, these respiration exercises are combined with walking, running and climbing upstairs, the respiration being regulated to successive movement of the right or left foot. Respiration should be of the inferior costal type, which implies abdominal at the beginning and apical towards the end of inspiration. These movements, of course, should be combined with suitable hygienic conditions.

J. D. Lithgow.

LARYNX.

Sytschow, K. (Moscow).—Trichloracetic Acid in Laryngeal Tuberculosis. "Zeitschr. f. Laryngol.," Bd. iii, Heft 5.

The writer first paints the laryngeal mucosa with the following solution: Cocaini muratici, 1.0; antipyrin, 0.5; ac. carbolic, 0.05; aq. destillat, 10.0. To this a drop of adrenalin may be added. Sytschow prefers the crystals of trichloracetic acid as they penetrate more deeply and do not spread; he deposits these in the ulcerating surface and has never seen oedema or spasm result. He claims that the applications are painless. In cases with unbroken mucosa the acid eats through the healthy epithelium and basement membrane. The author reports three successful cases of interarytenoid tumour treated as described, and twenty-two cases with ulceration, infiltration, oedema, and granulation formation. The dysphagia was relieved, the surfaces became healthy, the infiltration and oedema quickly diminished, the cough and hoarseness were greatly improved.

J. S. Fraser.

Sieur and Rouvillois.—Regional Anæsthesia of the Larynx in Tuberculous Laryngitis. "Arch. Internat. de Laryngol., de Otol., et de Rhinol.," May-June.

Boulay, in the *Presse Médicale*, January 15, 1911, has considered this subject, describing the three following methods: (1) Submucous injection of novocaine, (2) passive hyperemia of Bier, (3) injection of alcohol into the trunk of the superior laryngeal nerve. The author has only experience of the third method, and preferably employs, instead of alcohol, a $\frac{1}{2}$ per cent. solution of cocaine, which is injected according to the method described by Chevrier and Cauzard in the *Bulletin Médical*, February, 1910. The following is the method: Take a point along the superior border of the thyroid cartilage about 2 cm. from the middle line and 1 mm. or 2 mm. above this border. Inject the skin and submucous tissue slowly, pressing the needle towards the thyroid cartilage. The point of the needle is then directed slowly upwards and backwards, and the injection progressively finished. Gently massage the region with the thumb from below upwards, and from before downwards, to assure diffusion of the cocaine. It may be necessary to make these injections every second day. After the third or fourth injection the pain disappears. This method will also be found of use in tracheal or bronchial examination by Killian's method, and in endo-laryngeal surgery (cauterisation and removal of polypi). It may also be found of use in external operations, such as tracheotomy, thyro-fissure, and partial and complete laryngectomy.

J. D. Lithgow.

EAR.

Merrill, W. H.—A Case of Nerve-Deafness due to the Toxæmia of Diabetes. "Boston Med. and Surg. Journ.," June 5, 1911, p. 849.

Man, aged fifty-five. Deaf in right ear twenty years; left became deaf one morning, without vertigo or nausea. Treated by inflation with slight improvement. Urine contained a large quantity of sugar. The author considers the case to be one of neuritis of the eighth nerve. The case indicates the importance of general systemic examination.

MacLeod Yearsley.

Hintze, K. (Bangkok).—Labyrinth Syphilis in the Early Period of the Secondary Stage. "Münch. med. Wochens.," No. 22, May 30, 1911.

Evidently the recent publications of Ehrlich and Benario upon the subject of neuro-recurrence have reminded Dr. Hintze of this case, which he reports at considerable length. The patient was a man who had been under the author's care some years ago on account of syphilis. Seven months after the primary sore, and six weeks after the completion of two short and inadequate courses of mercurial injections, facial paralysis and ptosis, affecting the right side, suddenly supervened, but recovered after a month of further anti-syphilitic treatment. Two months later (ten months after the date of infection) the patient was suddenly prostrated, with great giddiness, accompanied by vomiting, tinnitus, and defective hearing in both ears. Under energetic treatment by mercury and pilocarpin injections the giddiness passed off in a month, but, owing to the patient going abroad, the ultimate results as regards the hearing and tinnitus could not be ascertained. Dr. Hintze, who has had a very large experience of syphilis, both in the tropics and in Europe, regards labyrinthine syphilis occurring in the early stage as very rare.

J. Stoddart Barr.

Leto, Dr. Luigi (Palermo).—Paralysis of the Abducent Nerve of Otic origin. "Bolletino delle Mal. d'Orecchia, etc.," Florence, 1911, p. 73.

In 1904 Gradenigo described the group of symptoms with which his name has been since associated—acute or chronic suppurative otitis media, violent pains in the parieto-temporal region, and paralysis of the sixth cranial nerve. The author refers at considerable length to the various views as to the pathogenesis of this condition in a paper too long and detailed to be adequately dealt with in an abstract. He gives the history of a man affected with this group of symptoms. There is a bibliography of nineteen references.

James Donelan.

BOOK RECEIVED.

A Practical Handbook of the Diseases of the Ear for Senior Students and Practitioners. By *Wm. Milligan, M.D.*, Aurist and Laryngologist to the Royal Infirmary, Manchester, and *Wyall Wingrave, M.D.*, Pathologist (lately Physician) to the Central London Throat and Ear Hospital, London. With 293 illustrations and 6 coloured plates. London: Macmillan & Co., Ltd., 1911.

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**THE INFLUENCE OF THE UPPER AIR-TRACT ON
RESPIRATION.¹**

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the Royal Society of Medicine.

LET us think of respiration not merely as a mechanical ingress and egress of respired air, or an interchange of gases in the lungs, but as a very complex biological process covering both external respiration and internal respiration in the tissues of the body. We shall then find that the subject to which I invite attention is one of far-reaching import, and has a very practical bearing on the principles of treatment of many widely differing affections of the upper tract.

It must suffice to mention the commonly accepted facts, viz. that in traversing the nasal passages the inspired air becomes sterilised by the arrest of all the micro-organisms; it is rendered dust-free; it is raised in temperature to nearly blood heat, no matter how cold the surrounding temperature may be; it is saturated with moisture, no matter how dry the outside air, so that on reaching the trachea the inspired air is completely warmed and moistened. These now well-recognised functions of the nose

¹ Introductory Lecture delivered at the Central London Throat and Ear Hospital, London, at the opening of the Winter Session, 1911.

are sufficient to impress us with the importance of the physiological value of nasal respiration. I propose to draw attention to other physiological functions which are of equal clinical import, though less generally recognised.

It may be well to recall very briefly certain physiological and experimental data before passing on to consider the clinical aspects of our subject.

I show on the screen a transverse section through the medulla of a mouse, by Cajal, showing some of the collateral fibres from the gelatinous substance of Rolando breaking up under the motor nuclei of the facial and vagus, from which he inferred that these several nuclei communicate. Now remember that the gelatinous substance of Rolando is the receptive nucleus of the fifth nerve, while the nucleus ambiguus is the chief motor centre of the vagus; the fifth nerve is the sensory nerve of the nasal mucosa; the vagus supplies motor innervation to both the bronchi and to the heart. And while common experience has led to the use of smelling salts to stimulate the flagging heart it has equally left us in no doubt that stimulation of the olfactory nerve may inhibit the heart's action and cause fainting (hence in some churches certain strong-smelling flowers are forbidden for decoration), while a strong smell may influence other branches of the vagus, causing nausea or even emesis. It may be that the latter is an ideo-motor reflex, but the physical effect is very real and obvious nevertheless.

These are a few commonplace evidences of the profound influence of the nose on the cardiac and visceral territories of the vagus, but equally does the nose influence respiration through the pulmonary vagus, the experimental observations of Spencer, Munk, and of Dixon and Brodie (1) leaving us in no doubt on these points.

Now the olfactory sense has probably a greater influence on respiration than is usually suspected, and it probably exerts its influence through the cerebral accessory respiratory centres; and through them on the bulbar centres. This may perhaps explain the effect of certain effluvia causing asthma—a pure hypothesis, but it is noteworthy that Spencer experimentally demonstrated that stimulation of the frontal lobe just outside the olfactory tract caused slowing or arrest of respiration; and snuffling action resulted from irritation of the mucous membrane of the nose in its upper part and of the olfactory nerves. These observations emphasise the importance of the olfactory fissure as the normal inspiration air-path.

The nasal passages may be regarded as the upper end of the respiratory tract, and physiologically as part of the tracheo-bronchial tree. It is known that inspiratory dilatation and expiratory diminution of the lung alternately stimulate the expiratory and inspiratory bulbar centres, and we can hardly avoid the conclusion that the act of respiration through the nose likewise actually stimulates the centres on which we know they act; and therefore is a physiological factor in the full and complete dilatation and diminution of the lungs. If that be true, it follows that the absence of nasal respiration tends to incomplete expansion of the lungs during respiration.

Allow me also to cite a few lines from the observations of Dixon and Brodie (1):

"The most important broncho-reflexes we have obtained are from the nasal mucous membrane. Excitation of this, either electrically, mechanically, or chemically, usually produces some degree of constriction, which as a rule comes on very gradually and is very persistent. . . . The most effective spot for bringing about the reflex in cats and dogs is a small area well back on the septum. We know that by excitation of this membrane the following reflex effects have been obtained:

"(1) Closure of the glottis.

"(2) Arrest or slowing of the respiration.

"(3) Cardiac inhibition.

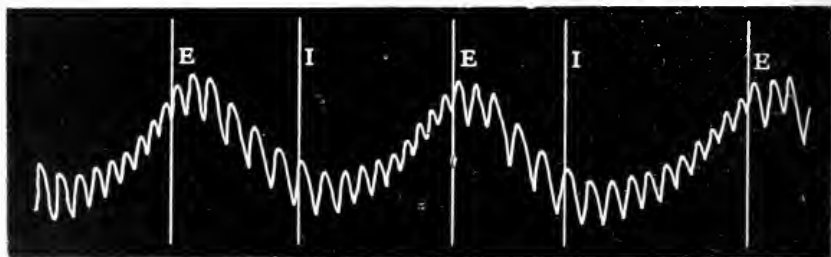
"(4) Dilation of the peripheral arterioles."

Those of us who have performed submucous resections of the septum under general anaesthesia can hardly have failed to note the marked fall in blood-pressure and weakening of the pulse, which is often definite and marked when the mucoperichondrium is being stripped, and I throw on the screen a blood-pressure tracing taken in the course of one of my operations.

Furthermore, the inhibition of respiration on palpating adenoids, and sometimes in the course of their removal under chloroform, the profound subjective sense of suffocation and weakening of the heart's action produced when a crumb or a drop of fluid "goes the wrong way," serve to emphasise the influence of the upper respiratory tract, first and foremost on the respiratory centres, and also, though, perhaps, to a less degree, on the correlated cardio-inhibitory and vaso-motor centres.

Before passing on to discuss the connection between the nose and asthma, may I point out that we are now certain of the existence of broncho-dilator fibres as well as constrictor, consequently the respiratory centre in the bulb must be correspondingly double, viz. inspiratory and expiratory. Here is a blood-pressure

tracing of a dog (Stirling's 'Physiology') showing Traube-Hering curves or respiratory undulations. This tracing is evidence that the inspiratory and expiratory respiratory centres induce rhythmical vaso-motor impulses in the vaso-motor centre, and we may infer that the double respiratory centre induces corresponding rhythmical bronchial dilatations and contractions, precisely as we know it does induce rhythmical abduction and adduction of the vocal cords. These are some of the grounds for the view I advanced in 1903 (3), viz. that, just as the alæ nasal above, and, lower down the respiratory tract, the vocal cords dilate and contract with inspiration and expiration, so do the smaller bronchi dilate and contract with inspiration and expiration. Thus air inspired through the open nostrils, glottis, and bronchioles is to some extent locked in



Carotid blood-pressure tracing of a dog (Stirling). I = commencement of inspiration: E = commencement of expiration. The respiratory undulations are due in part, at any rate, to a stimulation of the vaso-motor centre, which runs parallel with the respiratory movements, and which causes the arteries to contract, with consequent raising of the arterial pressure. The smaller number of pulse-beats during the greater part of expiration is due to the activity of the cardio-inhibitory centre in the medulla, this centre being comparatively inactive during inspiration. N.B.—Dog under simple anesthesia without artificial respiration, and vagi not divided.

the alveoli; hence inspiration is prolonged as compared with expiration. The irritation of an inflammatory condition, *e.g.* bronchitis, exaggerates this normal bronchial contraction, so that inspiration is still more prolonged as compared with expiration.

I suggest that in the dyspnoea of bronchial asthma, the stimulation of the respiratory bulbar centre has the same result, the normal expiratory bronchial contraction is exaggerated; hence expiration is so greatly prolonged that a fresh inspiration has to be taken before the last inspired air is completely expired, the inevitable result being over-distension of the alveoli and emphysema, difficulty in taking more breath, and excessive effort to empty the lung during expiration.

In hay-fever, the irritation of the fifth nerve causes reflex sneezing (expiratory) and lacerimation (vaso-motor). Now, by the law of reflex irradiation, with an increasing stimulation, the reflex action spreads to correlated areas; hence prolonged or severe hay-fever involves in greater degree the respiratory centre, and in a measure the corresponding vaso-motor tract. In other words, the patient suffers from asthma; that is, not something totally differing from, and at variance with, normal respiration, for in asthma the excessive irritation simply exaggerates the normal expiratory bronchiolar contraction, while corresponding vaso-motor disturbances are also engendered and constitute an important factor in the attack. Of course, I do not mean to suggest that precisely similar influences on the bulbar respiratory centres may not be engendered from other directions, *e. g.* the lungs, the stomach, and various toxic conditions of the blood—these are also causes of asthma—but it is certain that nasal disease does sometimes cause asthma. Surely it is but reasonable to refer the occurrence of bronchial asthma, in association with various abnormal conditions in the nasal passages, to irritation of the sensory fifth nerve causing reflex over-stimulation of its intimately correlated bulbar respiratory and vaso-motor centres in susceptible individuals.

Now, it is instructive to note the various stages in a developing nasal asthma associated with nasal polypus due to infective ethmoiditis. (I am not now referring to those patients in whom more or less complete occlusion compels the patient to be a mouth breather.) At first there is but little or nothing to be seen beyond perhaps slight turgescence in the mucosa; the patient complains of frequent sneezing, till the sneezing tends to culminate in asthma. We examine the nose and conclude there is no evidence of disease. In course of time, and it may not be for a year or two, the infection of the submucosa leads to grosser changes and polypi begin to develop, the asthma recurring with greater frequency. If we see the patient for the first time when the polypi are there, we are prone to conclude that these polypi have caused the asthma, instead of attributing the polypi and the asthma merely as the results of a common cause.

I think this explains why simple spurs and deviations of the septum very rarely cause asthma, at any rate unless they are so situated as to interfere with normal nasal respiration. I realise that such a statement may meet with objection from those to whom a septal spur of any kind is anathema, and who claim that, as the removal of these innocent spurs in asthmatics has resulted

in cessation of asthmatic attacks, at any rate for a time, it follows that the spurs caused the attacks. How such fallacies may arise it is not difficult to explain. Some twenty years ago, when one used the galvano-cautery more frequently than we do now, I was impressed with the effect of canterisation of the septum and of the middle turbinal region in asthma, though realising that the canterisation could only exercise a temporary influence. But in 1896, after prolonged observation, I made the statement (4) that—

“There is undoubtedly a close connection between the nose and asthma. One thing I can positively assert from practical experience, viz. that stimulation of the nasal mucous membrane by a superficial cauterisation or other means will altogether keep off or greatly modify attacks of asthma in a large percentage of cases, and thus enable one to pursue tonic treatment of asthmatics without resorting to the usual asthmatic sedative inhalations and remedies. I wish distinctly to say that I do not advocate the intra-nasal treatment of all cases of asthma. Each case must be treated on its merits.”

Yet, although I believe I was the first to point out the effects of cauterisation of the nasal mucosa on asthma, I was not convinced by the percentage of cures published by Francis (5) six years later, when, as I have no doubt, my earlier contribution had escaped his notice. A submucous resection of the septum, or, in fact, any intra-nasal operation, may favourably influence the attacks of asthma in the same way, though a more permanent and beneficial influence is often established on quite different grounds, when by such means a definite intra-nasal obstruction is removed with the effect of re-establishing normal nasal respiration.

This brings me to another point which I have touched upon above—the influence of a normal air-path in nasal respiration.

One sometimes meets with patients who complain of stuffiness in the nose, and who yet can breathe air in and out through the nose; and the subjective sense of obstruction is due either to an enlarged middle turbinal, ethmoiditis, a septal deflection high up, or some cause of obstruction in the normal air-path through the olfactory region, and occasionally cases of failure follow submucous resection of the nose, from the fact that though the patient can breathe freely in and out of his nose, the freedom is confined to the lower part of the nasal passage. It is most important to avoid being over-conservative if the patient is to get the full benefit of a septal resection.

It is as easy to exaggerate as to under-value the importance of those nervous respiratory influences of which I have spoken. There are many persons who flourish, although they never take

exercise, spend their days—or at least their nights—in vitiated atmosphere, and never take a cold bath; nevertheless exercises, fresh air and bathing are not without influence on health and disease. Similarly one constantly meets with patients who have had marked nasal stenosis for many years, without discomfort and without symptoms; yet in a considerable proportion there is at least some degree of apathy, an absence of that fulness of life and energy which one expects in an otherwise healthy and normal individual. In such a restoration of nasal respiration often proves most helpful, and sometimes, in my experience, results in increase of appetite and weight, intellectual quickening, and general *bien aise*.

With normal nasal respiration the oxygen and carbonic acid exchange in the alveoli with more rapidity, and the lungs are more fully distended; and I think the incidence and course of pulmonary tuberculosis may be deduced from the notable improvement in such cases following the restoration of normal nasal breathing in phthisical patients. Dr. Dundas Grant (6) has quite recently directed attention to the importance of normal nasal respiration in phthisis, and to the distinct improvement in the patient's lung condition that results from the removal of obstructive defects, and the treatment of conditions productive of nasal catarrh or purulent secretions.

With reference to the same question, Dr. Thurnam, of Nordrach-on-the-Mendips, has written to me his opinion as follows: October 19, 1911, "Certainly all those mouth-breathers whose nasal obstructions I have seen removed have got improved expansion of the lungs afterwards, and the cure of all of them was assisted." While Dr. Etlinger, of the Cotswold Sanatorium, writes October 15, 1911: "As a result of my ten years' experience I cannot speak too strongly of the importance of a normal condition of the upper air-passages in preventing consumption and other pulmonary diseases and in helping the cure of these. I have been able to follow the most marked improvement in the pulmonary condition which follows upon radical cure of any abnormality in the upper passages." But no one with a proper appreciation of the physiology of nasal respiration could make the extraordinary proposition recently put forward by Bucklin (7), who claims that by removing more or less one-fourth of the lower turbinal, and thus, as he states, diminishing the difference between internal and external atmospheric pressures during inspiration, one can cure pulmonary consumption, because thereby the patient will be subject to the

conditions prevailing at an altitude of over 15,000 ft. I suppose we are to infer that with a full-sized tracheotomy tube *in situ*, the consumptive would enjoy at home the advantages of an altitude of 30,000 ft. or more. Anyhow, we may be sure the poor man would be nearer Heaven!

Let us take a lesson to ourselves, and avoid attaching undue importance to anatomical abnormalities in the nose, unproductive of symptoms, and calling for no interference.

Finally, let us consider the influence of adenoid growths and enlarged tonsils on respiration. In doing so we may assume, of course, that you are all aware of one of the most common effects of adenoid growths on the resilient chest-walls of children, due to the physiological persistence of nasal respiration during sleep; and you have in your own practice realised the change that operative treatment effects from the anæmic picture of apathy, with half-filled lungs, subnormal temperature and so-called "poor circulation" into the bright, ruddy-faced child. These clinical experiences are widely known and accepted, but I do not think we should assent to the prevalent theory that the interference with nasal respiration is simply a mechanical obstruction of the choanæ narium by the increased size of the naso-pharyngeal tonsil (if we exclude quite exceptional cases of unusually large adenoids). Otherwise we should find that there is a fairly definite correspondence between the size of the adenoids and the degree of nasal obstruction on the one hand, and of the Eustachian tubes on the other, which is certainly not the case in my experience. Often one finds that the most pronounced and characteristic symptoms, including catarrhal otitis, are due to relatively small adenoid growths; while on the other hand we sometimes meet with children with perfect nasal respiration, apparently in excellent health, in whom it has proved necessary to remove adenoids simply on account of recurrent catarrhal otitis; and it has been in such cases that I have removed some of the largest masses of adenoids I have ever seen.

It appears to me that the explanation of these facts is that adenoid growths are in reality lymphoid tissue which hypertrophies in response to infection. In conjunction with my colleague, Prof. Walker Hall, I have been able to prove the presence of streptococci, staphylococci, pneumobacilli and streptobacilli in the interior of adenoid growths, and it seems probable that the invasion of such organisms are the essential causal factors of adenoid growths (8), and that corresponding infections through the tonsillar

crypts result in chronic enlargements of the tonsils. Since lymphoid hypertrophy is in a sense protective, we find small infected tonsils and adenoids may exercise their inhibitory influence on the virulence of the infective organisms less completely than those larger masses of adenoids or faucial tonsils which may exist without causing any symptoms. If we may attribute to these lymphoid aggregations the rôle of an "organism-destructor," it would seem they are protective only up to a point; to put it broadly, "they bite off more than they can chew," and thenceforth serve as breeding-grounds whence the mucosa of the nasal passages, the Eustachian tubes, or the trachea and bronchi are constantly re-infected. It is the resulting rhinitis which causes the symptoms of nasal obstruction, the salpingitis of Eustachian tube obstruction.

I have already made allusion to the physiological influence on respiration through the olfactory and trigeminal afferent nerve-fibres. Adults may suffer little more than discomfort from the nasal mucosa being covered with mucus, but children, for good or ill, are in far greater degree susceptible to reflex influences. So when they have constant rhinitis from adenoids they are deprived night and day of one normal stimulus to fill their lungs, consequently, even when they do not snore (for every child with adenoids does not snore), and there is no obstructive dyspnoea, their lungs are unfilled, and we find dulness and flattening below the clavicles. Yet such defects hardly attract attention when, owing to marked inspiratory embarrassment during sleep, the typical infra-mammary recession and pigeon breast develops the more characteristic chest deformities due to well-marked adenoid growths.

But if it is to the infective character of tonsils and adenoids we must attribute their influence in causing nasal obstruction, it is likewise to the same causes we must attribute in larger measure the lassitude, anæmia, and "poor circulation" which are the legacy of chronic sapræmia; and not the least important and striking result of removing the source of chronic blood-poisoning is the disappearance of anæmia, increased tissue metabolism, and consequent increased oxygen demand of internal respiration, and so-called "improved circulation"—ridiculously so-called, for of course the circulation remains much the same (it is the tissues warm the blood, and not the other way round). The broad lesson conveyed is that, speaking generally, it is the presence or absence of symptoms that should determine the question of operative removal of adenoids and tonsils, and not their being merely larger or smaller than normal; that we should no more remove fairly

healthy tonsils, faucial or naso-pharyngeal, than we would a sound tooth, on the excuse that it may become diseased if left; but that, just as we sacrifice a diseased tooth, so must we often sacrifice diseased tonsils and adenoids, which, like septic teeth, may be productive of grave systemic symptoms.

I have touched on but one small corner of our work as laryngologists, mainly with a view to emphasising the importance of constantly harking back to the general principles of medicine and surgery, in approaching even the simpler problems of the specialist, and having due regard to the interdependence of all our members. Thus, my parting advice to the young rhinologist is "look beyond your nose."

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DISCUSSION ON THE TREATMENT OF CHRONIC ADHESIVE PROCESSES IN THE MIDDLE EAR.¹

OPENING PAPERS.

I.—MACLEOD YEARSLEY, F.R.C.S.,

Senior Surgeon to the Royal Ear Hospital; Medical Inspector of London County Council Deaf Schools; Lecturer to the London Training Colleges for Teachers of the Deaf; Examiner to the Joint Examination Board for Teachers of the Deaf, etc.

MR. CHAIRMAN AND GENTLEMEN,—When I was honoured by the request to open a discussion upon the treatment of chronic adhesive processes in the middle ear I at once sought to know the time at my disposal. A moment's reflection reveals the magnitude of the subject, which is one for which a variety of treatments has been suggested. The prompt reply of the honorary secretary,

¹ At the meeting of the British Medical Association (Oto-Laryngological Section) at Birmingham, July, 1911.

however, limits me to a period not exceeding twenty minutes, and I understand that I am to indicate the most debatable points at the present time, stating my views thereon and asking you to do likewise.

Gentlemen, there are many debatable points in the matter before us, and, before we discuss them, it will be well to endeavour to define what chronic adhesive processes in the middle ear we are to consider. The term includes chiefly the results of suppuration—post-suppurative adhesive processes—and those results of chronic non-suppurative middle-ear inflammation which are best described as post-catarrhal middle-ear conditions. It might, at a stretch, be made to include otosclerosis, but I prefer to regard this condition as one affecting primarily the labyrinthine capsule rather than the middle ear and, as such, I shall not consider it as coming within the province of this discussion.

We shall understand, therefore, by chronic adhesive processes in the middle ear, those cases in which there is interference with the functions of the conductive apparatus—tympanic membrane, ossicles, Eustachian tube, and lining membrane of the middle ear—the abnormalities found being due either to cicatricial tissue left by a former suppuration, or to adhesions resulting from a chronic catarrhal inflammation.

In order to treat these conditions successfully, it is of the highest importance to make as accurate a diagnosis as possible at the outset, and this can be done only by careful consideration of three things—symptoms, the result of physical examination, and the evidences afforded by careful functional testing. The important points in these three factors may be stated briefly as follows:

Symptoms.—The amount and character of the deafness and the improvement after inflation, especially as regards the length of time such amelioration lasts. The presence and character of tinnitus. The presence of paracusis Willisii.

Physical Examination.—The condition of the tympanic membranes as to texture and inclination. The mobility of the malleus. The condition of the Eustachian tubes. The condition of the nose and naso-pharynx, and especially the condition of the fossæ of Rosenmüller. The general condition of the patient.

Functional Examination.—The evidence afforded by Rinne's and Gellé's tests. The condition of the bone-conduction. The acuity for low tones and for high tones. The relation between the acuity for the acoumeter, spoken and whispered speech. It has been pointed out that the relative acuity of these three tests affords a rough guide to prognosis, which is usually better when the hearing

for the aconimeter and spoken speech is better than that for the whisper, and worse when that for the aconimeter and spoken speech is worse than that for the whisper.

It is most important to ascertain, before commencing treatment, the presence or absence of secondary internal ear complications and the condition of the stapedio-vestibular articulation.

Putting aside for the moment all question of prophylaxis or of treatment of the conditions which have led to chronic middle-ear adhesive processes, and assuming that we have only the finished product of these processes to deal with, what methods of treatment have we at our disposal and what are the indications for their employment?

Gentlemen, it has been said that those diseases for which a multitude of remedies has been recommended are usually the most intractable. I am afraid that this is the case here. There is no denying that chronic middle-ear adhesions often tax our skill in treatment to the utmost, and that the methods which have been suggested for dealing with them are numerous. Moreover, if one reflects upon these methods it will be found that most of them are based upon inflation and otomassage, and that very few of them are remarkable for their originality. Not infrequently if we analyse some much vaunted treatments we find that any success gained by their means is really due rather to such adjuncts as inflation and nasal treatment employed in conjunction with them.

The value of regular inflation and the use of bongies in suitable cases together with the rectification of abnormal conditions in the nose and naso-pharynx need not be more than referred to here; they are sufficiently established methods of treatment. I would like, however, to draw attention to one or two points regarding them. Inflation should, whenever possible, be done through the catheter, because it is cleaner and better under control than the Politzer bag. Moreover, in my experience, inflation is often done too irregularly and not at sufficiently frequent intervals. A short course of catheterisation three times weekly, in some cases even daily, gives much better results than when the instrument is used at intervals of seven days. Another point, and one of importance in inflation, is the necessity of carefully guarding against over-inflation and consequent stretching of the membrane, and I think that for this reason the teaching of patients the Valsalva method and the prescribing of appliances which require the practice of this method are to be deprecated. As regards nasal treatment, I want especially to emphasise the importance of Rosenmüller's

fossæ and the conditions found in them in most cases of chronic middle-ear deafness. The invention of the electric naso-pharyngo-scope should stimulate the study of this region and its relation to chronic middle-ear troubles. If one can judge by the literature of this recess, small anatomically, but looming very large when its relative importance in treatment is considered, we are somewhat behind our transatlantic colleagues in this point. No doubt when the enormous part played by the nose and naso-pharynx in the well-being of the individual has come to the full recognition it deserves, not only from the profession but from the lay public as well, then chronic middle-ear suppurations and catarrhs, and, as an obvious consequence, chronic adhesive middle-ear conditions, will be less frequently met with. It is in this direction that rational treatment, which is prophylaxis, lies. One must allude to prophylaxis, because I believe it to be the treatment of the future, but as we are to deal to-day with the finished article rather than with the raw material, there is no time to do more than mention it.

Before going any further there is, I think, one question upon which it would be worth while to obtain an expression of opinion from such an assembly as this. It has been discussed before but can be discussed anew with profit. In well-established cases of deafness from chronic adhesive processes in the middle ear, how far are we justified, apart from other nasal considerations, in recommending nasal treatment? In some cases there can be no doubt as to the reply to this question; their indications are perfectly clear; but there are a number of borderland cases in which it is difficult to decide. My own feeling in such cases is that the matter should be put clearly and conscientiously before the patient, and, if a course of treatment by catheter, etc., is attended by appreciable improvement, we are justified in urging the correction of any nasal abnormality which is contributory to the aural condition. I would indicate this question as one worthy of your attention in this discussion.

Assuming that regular inflation, nasal treatment, and attention to general conditions, such as gout and rheumatism, syphilis, and those due to pyorrhœa and intestinal toxæmias (the relations of which to the ear well repay investigation), are established beyond question as our most reliable methods of treatment, there is a host of measures, which are adjuncts to these, concerning which the collective experience of experts would be valuable if collated and analysed. These may be divided into non-operative and operative.

Of the non-operative adjuncts to treatment I would suggest for

discussion otomassage, applications of hot air, various intra-tympanic injections, electrical treatment, and the use of thiosinamine, or its derivative, fibrolysin. Some years ago thyroid extract was advised, but my own trial of it, described in a paper read before the Association's meeting at Edinburgh in 1898, resulted in uniform failure, even in one case with myxœdema. I do not know whether any of those present have had a more fortunate experience.

Otomassage is, in my opinion, a valuable method if used with discretion. I published my experiences of its use in the JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY for 1907. Short piston stroke and rapidity of vibration are points to be observed. Otomassage requires to be used with caution, and should not be continued when improvement no longer takes place. Indiscrete application may do more harm than good.

Applications of hot air have been recommended both by the meatus and by the Eustachian catheter. The former method was put forward with great enthusiasm in 1901 by Hopkins, of Cleveland, Ohio, who advised the use of superheated air *per meatum* in cases of chronic catarrhal otitis media with ossicular ankylosis. He claimed to have treated sixty-two cases with only four failures. He used air at temperatures up to 400° F., with inflation and massage. I obtained his apparatus in 1902, and the first case in which I used it gave excellent results, but the twenty-four which followed convinced me that any improvement which followed was due, not to the superheated air, but to the inflation and massage used concurrently. I therefore abandoned its use.

Other otologists have advised inflations of hot air through the catheter, and Come Ferran, of Lyons, advocated this method, by means of an apparatus of his own design, before the French Otological Society in 1908. I have this apparatus, and found that, although hot inflations are possibly more pleasant to the patient than cold ones, results with the former were no better than those with the latter.

The intra-tympanic injections which have been suggested are numerous: oily fluids containing menthol, solutions of iodine, iodide of potassium, bicarbonate of potassium, or of pilocarpine. Some years ago Cohen Kysper advocated the use of a solution of dog's gastric juice, but I have been unable to trace any further experiences relating to it. I believe that the most valuable of these injections are preparations of liquid paraffin, with or without menthol, and the solution introduced by Lake, containing 16 gr. of

red iodide of mercury, with ʒvij of lanolin, made up to ʒiv with parolein. This last has certainly given me good results, especially in conjunction with otomassage, in cases where simple inflation has failed.

At one time a good deal was written as to the effects of electrical treatment. Whilst a certain number of cases of Eustachian stenosis appear to be ameliorated by this method where ordinary treatment has failed, I think the general consensus of opinion has been to limit its application. In 1909 Urbantschitsch published results of his electrical treatment in fifty cases of deafness arising from past middle-ear catarrh and suppuration. He used a current of from $\frac{1}{2}$ to 2 m.a., derived from a small portable dry galvanic battery, which the patients used themselves, one application a day of about thirty minutes' duration generally being prescribed, the number of applications in some cases being as many as sixty-six. This was combined with politzerisation, massage, and the passage of bougies. The hearing was apparently made worse in at least two cases, and in one the tinnitus was increased. No improvement was manifest in more than half the number of cases, the remainder showing an increase of hearing in variable, but mostly small, amount. Tinnitus was relieved in thirty-three cases and absolutely cured in four. What are your experiences of this or any other form of electric treatment?

The use of thiosinamine or its derivative fibrolysin seems to have resulted in the expression of diverse opinions, some almost enthusiastic, others of disapproval. What have been the experiences of those present? For myself I have tried it in twenty cases, two of which were instances of post-suppurative adhesions, one of mixed otosclerosis and catarrh, the remainder being late stages of chronic middle-ear catarrh. The results were published in the *JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY* for May of this year. They were disappointing; three were improved, sixteen were unimproved, and one was doubtful. In a limited number of cases it may prove of use, but such cases require careful selection. I may point out here that one of the cases improved volunteered that he had lost his *paraensis Willisii* after about the tenth injection, which seems to support the ossicular ankylosis theory of that symptom. *Paraensis Willisii* is an interesting symptom, and we have recently been offered a new theory regarding its origin. I must confess that those of Willis and Politzer are unsatisfactory, but I think that of Siebenmann is a very rational one.

Passing now to operative methods of treatment there is ample food for discussion. Mobilisation of the malleus, incision of the posterior fold, tenotomy of the tensor tympani, tenotomy of the stapedius, exploratory tympanotomy, the division of adhesions, removal of portions of the membrane and removal of the major ossicles have all been suggested. It would be well if the relative value of, and the indications and contra-indications for, these procedures could be authoritatively laid down. In my hands mobilisation of the malleus has been successful in several cases. I have also found division of the posterior fold and tenotomy of the tensor tympani occasionally useful. Exploratory tympanotomy is often disappointing. In one case I found three fine fibrous adhesions passing from the head of the stapes to the brim of the pelvis ovalis, and the division of these was attended by permanent benefit to the hearing. Occasionally exploratory tympanotomy gives transient improvement whilst the opening remains unhealed, and in such cases it is likely that if a permanent opening could be secured a good result would follow. There is, of course, the danger of setting up suppuration, but under modern conditions this is reduced to a minimum. In post-suppurative cases, where the long process of the incus has gone and the stapes is tilted by the unopposed action of the stapedius, tenotomy of the tendon of that muscle sometimes gives excellent results.

I have tried several times to remove a very lax posterior segment of the tympanic membrane when it has rested upon the incudo-stapedial joint and impeded the ossicular mechanism. I cannot say, however, that my endeavours have met with much success. In connection with flaccid tympanic membranes I should like to discuss the treatment and theories advanced by Mr. Heath. The matter requires careful consideration, not merely amongst practitioners in general, but amongst those who make a speciality of otology. Accepting his statements as published they would appear to be at variance with accepted teaching, but of course none the less deserve attention at our hands. If after such consideration they fail to meet with recognition the sooner we know this the better; on the other hand, if the former teaching be proved to be erroneous in this respect we must act accordingly and proclaim the new truths.

Lastly, what is the consensus of opinion as regards ossiclectomy in advanced cases of middle-ear adhesions, post-suppurative and post-catarrhal? I am not enamoured of the operation in such cases, and I am not even sure that it is justifiable.

Whatever method, non-operative or operative, is employed, considerable numbers of cases remain unrelieved. In such cases there are two courses open—lip-reading and aids to hearing. The value of the former is undeniable, but it is not always easy to persuade patients to take it up seriously.

In the matter of aids to hearing there is room for valuable research. Otologists are to blame for having neglected this aspect of deaf work, and have indirectly contributed thereby to make it a lucrative hunting ground for quacks. From the study, hitherto slight, that I have made of electrical aids, combinations of microphone and telephone, I think that there is a useful field for these instruments. Investigation is wanted. There is no reason why we should not be able to discover what type and strength of instrument is adapted to different degrees and forms of deafness and to individual cases of advanced middle-ear disease. It is useless for the expert electrician to tackle the subject alone, because he has no knowledge of the conditions for which his instruments are to be used. It is equally unprofitable for the otologist to work at it unaided, because he has not, as a rule, any expert knowledge of telephones and similar contrivances. What is required is a joint investigation by the otologist and the electrician so that they can mutually co-operate. I see no reason why such an investigation should not result in our being able to order an aid adapted to an individual case, much as the ophthalmic surgeon orders the correction necessary for his patient's error of refraction. It would be worthy of this assembly if, among other points of treatment discussed to-day, some such investigation as I have suggested could be set going.

II.—DR. HUGO FREY,

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IF we wish to give a critical description regarding the present state of the treatment of the chronic catarrhal adhesive processes in the middle ear, we meet with considerable difficulties. Those difficulties are of various kinds. Let us put aside for a moment the fact that the methods of treatment up to now in use are not always of a very satisfactory nature, and that the application of these methods is rather limited in many cases. With this point the main part of my paper will have to deal. But the number of the

different methods of treatment proposed is so large that it is hardly possible for one man to try all of them in a great series of cases, and to form a definite conclusion based on sufficient personal experience. Therefore one has to rely to a certain extent upon the experiences gained by others, and this is where the first difficulty comes in. We actually find that a great number of cases are classed under the heading of "chronic catarrhal adhesive processes" which doubtless could not be counted among them if an exact diagnosis were made. And therefore when cases of different pathological character are considered simultaneously, as far as the results of treatment are concerned, we are no longer able to adjudicate on a safe basis the value of any of the therapeutics used. Notwithstanding the work which has been devoted to this matter for many years, there still exists a great confusion in the terminology used. This fact is obvious enough when one sees that the terms "chronic catarrh," "chronic adhesive process," "dry catarrh" and others are continually being used and interchanged without distinction. Furthermore, doubtless not sufficient distinction is drawn between the real otosclerosis and the chronic adhesive processes. We find again and again that those who try new methods of treatment begin at once on chronic catarrhal adhesive processes as well as on cases of the real otosclerosis of the classical type described by Politzer. Many authors do not furnish their reports with exact clinical records; we cannot, therefore, form any reliable judgment of their propositions and may perhaps overlook things of a possible value. Another source of mistake will be found in the fact that the chronic catarrhal adhesive processes are not sufficiently kept apart from the lesions of the inner ear. It is not very rare to find among reported cases that the deafness mentioned is of so high a degree that this alone would assure a concomitant affection of the cochlear apparatus. In spite of all the progress that has been made in the matter of the functional tests these do not seem to be sufficiently regarded everywhere. I want to emphasise that the first step on the way to progress in treatment must be a systematic and close examination by all the possible methods so that cases may be diagnosed beyond all doubt. Under the name of "chronic catarrhal adhesive process" we should only understand such changes which anatomically are characterised by a hyperproduction of the connective-tissue substance in the middle ear, and which clinically show a long duration and perhaps take a progressive course. These cases must furthermore show visible changes on the membrane in the shape of retraction,

atrophy or thickening, and must bear the characteristics of a trouble of the sound-conducting apparatus when applying the functional test. That means especially an unmistakable lengthening of the bone-conduction. Cases where one of these characteristic elements is missing should by no means be classified under the heading of "the chronic adhesive processes." (There is of course a possibility of combined cases, especially with lesions of the inner ear; these should not, however, be taken into consideration at this moment.) The examination of the bone-conduction should be made as exact as possible. I may be allowed on this occasion to quote a modification of the bone-conduction test which I proposed a short while ago, and which, as I think, may be valuable in increasing the exactitude.¹

If we stop to consider the chronic adhesive processes according to the points just mentioned, we can explain their appearance only on the basis of previous catarrhal or inflammatory processes. Besides these a number of cases might be taken for troubles corresponding to senile involution, since we know that with increasing age some organs show a hyperproduction of their connective tissue at the expense of the epithelial tissue. But if the chronic adhesive processes owe their existence to previous catarrhal or inflammatory processes, they are far from being catarrhs or inflammations themselves. The real catarrh, which consists in a swelling, loosening and hypersecretion of the mucous linings, is the primary, the chronic catarrhal adhesive process the secondary condition. It might happen that at the time when the chronic adhesive process develops, troubles of the catarrhal kind are still present. But even where those two are found in combination, we must separate them sharply one from another.

If I say that the diseases which we call chronic catarrhal adhesive processes do not follow only on catarrh, but inflammation as well, I do not refer to those conditions which are found after the healing of long-lasting chronic suppurations, and in which we find extensive scars or dry perforations. Those belong to a different group altogether, although the treatment might sometimes be a similar one. Here it is a question of those cases frequently seen, where troubles with the characteristic qualities described above follow on acute otitis. That the chronic adhesive processes are very often a consequence of acute otitis does not always seem to be sufficiently recognised.

¹ H. Frey, "Eine neue Methode zur Bestimmung der Kopfknochenleitung," *Monats. f. Ohrenheilk.*, vol. xlv, p. 531, 1911.

The relationship between real catarrhs and otitis on the one side and chronic adhesive processes on the other is very often obscured, mainly because the functional troubles in those cases often develop rather late. Deafness does not always follow immediately on a catarrh or a series of catarrhs, or on one or more inflammations. (Inflammations of a minor intensity seem to be a comparatively frequent cause of the chronic adhesive process.) On the contrary, it often takes many years before any changes become noticeable in the shape of functional troubles, and we therefore meet with chronic adhesive processes, the deafness of which is a consequence of contraction and constriction of such connective tissue, having appeared for the first time many years ago after acute inflammations. It seems that increasing age brings an inclination to the induration of connective tissue, and that, therefore, deafness appears sometimes after the third or fourth decade of life in consequence of a chronic adhesive process, the seed of which was sown in early youth.

If, therefore, we wish to discuss the question of treatment, we must take the points just mentioned into consideration. The *prophylaxis* appears to me to be of just as much importance as the actual treatment. In view of the fact that almost all catarrhs and inflammations of the middle ear have their starting-point in the naso-pharynx, we must devote special attention to these parts. This, however, one must be careful to do in the early period of foregoing catarrhs or otitis, and it must not be deferred until the chronic adhesive process has already formed. Changes of a more important nature having established themselves in the middle ear, our treatment of nose and throat will often come too late, and the results obtained therefrom will not come up to the expectations generally hoped for. The failure of rhino-pharyngeal treatment in somewhat advanced cases was so thoroughly discussed by Dr. McBride and Sir Felix Semon at one of the former meetings of this Association that I need say no more. It is, therefore, our first duty to bring into perfect order the naso-pharyngeal space of individuals afflicted with repeated acute catarrhs or otitis, especially so in the case of children or young people. It is not only adenoids and hypertrophies of the tonsils, but pathological conditions of the septum, turbinates and accessory sinuses, which call for our careful attention even in the case of children. The objection has often been raised that in the case of adenoids too many operations are performed. In my opinion this is not so. It is here not only a question of removing such formations in order to heal

actual troubles, but it is a question of preventing possible future trouble. I firmly believe that, as soon as this principle becomes a generally established one, cases of chronic adhesive processes will be correspondingly reduced in number, just as chronic middle-ear suppuration has become more rare—a fact not to be denied—owing to the improved treatment of acute otitis.

In cases of chronic catarrhal adhesive processes we have to deal with two sorts of complaints: deafness on the one hand and subjective noises or tinnitus on the other. There is, to my idea, no specific treatment for subjective noises, nor can there be any. Everything able to influence the real changes in the middle ear will help to relieve the subjective noises, and nothing else in all probability will do so.

Deafness in our cases is a form of mechanical obstacle in the sound-conducting apparatus; therefore the first aim of our treatment must be to find a way of mechanically reducing or removing this obstacle. Every mechanical treatment should try and attack such an obstacle locally. We are, however, rarely in a position to proceed on these lines, and are, therefore, limited to applying such methods as will act on the whole of the middle-ear apparatus in the hope of facilitating its mobility. Of this sort is the mechanical effect of the current of air in Politzer's method or in catheterisation. Even nowadays these methods are incomparably the best if any remains of mobility are still existing; no other treatment assures us of such a gentle and equable distension of the parts concerned. Of course we must reckon with the fact that the treatment should extend over weeks or months with short intervals in the more severe cases. The proposed use of carbolic acid or oxygen instead of air has not, to my idea, brought much improvement. As a complement to this treatment may be mentioned pneumatic massage. This is now generally carried out by using an electro-motor, and we apply both the positive and the negative impulses (compression and aspiration). Cordes and Bentzen recommend this massage after having previously set the meatus under a strong negative pressure. In the few cases where I saw this treatment carried out the success was not very strikingly superior to the simple massage. Lucæ was of the opinion that only positive pressure (compressions) should be used; Hegener, on the other hand, on theoretical grounds, recommends the negative impulse only. The method of applying massage with water (according to Lucæ) or with mercury (after Beck) does not seem to offer a great advantage; I personally have never tried this treatment

The value of the air douche and the catheterisation lies above all in the distension of the middle-ear apparatus, but also at the same time in the dilatation of the Eustachian tube. For this reason all methods are of importance which produce such a dilatation of the tube in cases where it is narrowed. The application of the bougie (*i. e.* of the simple one) often gives very satisfactory results. The electrolytic bougie, so often recommended, does not seem to have anything more than a mere mechanical effect.

We must never overlook the fact that even minute changes of the lumen of the tube can have an important influence on the hearing. This fact can be demonstrated easily on Professor Kreidl's model of the middle ear. In addition to the foregoing methods, all other methods are of advantage which produce a dilatation of the lumen of the tube by either bringing about a diminution of the swelling of the mucous lining, or a reduction of the volume of the tissue altogether.

Adrenalin injections, which have been proposed to that end, have, I find, only a transient effect. On the other hand, the *vibratory massage* of the tube and its surroundings, *i. e.* the lateral wall of the pharynx and the posterior end of the inferior turbinate, which were inaugurated by Urbantschitsch Senr. and Junr., have often brought about good results. The treatment consists in introducing a bougie into the tube, which thereafter is brought into quick vibration, either manually or by help of a small electric apparatus. Furthermore, the mucous lining of the pharynx and the inferior turbinate is gently tapped with a button-probe; this must be done quickly, smoothly, and by a vibrating movement. Where this treatment was applied for a certain length of time it really proved to be satisfactory in cases where catheterisation, etc., showed only a temporary effect, while hereby I obtained an improvement for quite a period. I have never had an opportunity to try Roure's steel bougie or the catheter improved by Koenig, which latter permits a simultaneous working of the air-douche and the bougie. Of the various other methods of massage I have only successfully worked with the gross vibratory massage, making use of the electro-motor and pelote, and applying it on the mastoid process, tragus, and the infra-auricular region. I have found that this treatment, in addition to others, often produces a relief in the patients' subjective feelings, without being successful if applied only by itself.

Regarding the injection of vapours into the tube and tympanic cavity, I think that the drugs recently brought to our notice (such

as sulphur, etc.) do not differ in their action from those that have always been in use. The injection of liquids of various description also does not seem to have a better effect than liquid paraffin, to which solely I adhere. The injection of fluids likely to produce irritation ought, I strongly consider, to be abolished in cases of real chronic adhesive processes. (This does not concern cases where real catarrhal processes are still present. Here injections of weak solutions of nitrate of silver are a valuable help. The solution may, however, not enter the tympanic cavity itself, but only come into contact with the tubal walls.)

There is another sort of treatment which, to my idea, has not been sufficiently adopted up to now. This is the application of *hot air* and *hot steam per tubam*. Be it that one uses any apparatus of an older style or the newly constructed models with electric-heating, I have always found that in a great many cases the subjective noises and deafness are influenced not only more efficaciously, but also quicker than by any other treatment. The beneficent effect of this treatment seems to lie in the fact that the damp heat, the physiological effect of which is well known, puts the tissues into such a condition that the mechanical force, applied at the same time or afterwards, acts both more easily and more thoroughly. I therefore do not hesitate to recommend this method. Correspondingly I have seen good effects by external applications of hot air directed to the aural region.

Some patients have reported that after sun-baths, which they took for other reasons, there was a marked improvement in their hearing and in the subjective noises.

Electrical treatment of chronic adhesive processes is valued rather too highly, according to my personal experience. The influence of the faradic, galvanic, and high-frequency currents, certainly of great importance in the lesions of the inner ear, is a very small one in our cases. In this line I should advise, if at all, the use of the small electrodes, wrapped in cotton-wool, as recommended by Urbantschitsch, to be applied to the outer surface of the membrana tympani. I think, however, that here the cataphoretic action is more essential than the real galvanic effect. Quite a new method is the application of light rays, recommended by Manciola and Dintenfass. The first-named author used a Nernst lamp of 200 N.K., the light of which is directed into the meatus by means of a special apparatus. The second author introduces a small lamp into the meatus itself. This method I know from my

own experience, and several patients have informed me that the subjective noises have been greatly reduced, and in some cases have even disappeared after such an application.

Some words should be said about thiosinamine and its derivative, fibrolysin, both of which have been largely used during the last few years. We have all read quite a number of opinions about these drugs, partly of an enthusiastic, partly of a negative character. My own experience is that in cases of real chronic catarrhal adhesive process no effect worthy of the name could be recounted, even when applied repeatedly and in full doses. In cases of adhesive processes after chronic suppuration, however, I have had good, sometimes even remarkable results. These cases do not belong to the subject of this report, and I cannot go into details about them.

The preparation called "myelocen," recommended by Chalmers Watson, I have not been able to try, as it is not obtainable in Vienna.

The internal treatment of the chronic catarrhal adhesive processes with iodine and its preparations is, to my mind, not only superior to all other preparations in use, but it is also a very necessary, sometimes indispensable, supplement to local treatment. I have always tried to keep the patient under iodine medication for at least six weeks, prescribing only medium doses; very good results have been the outcome of this often enough, but complete failures became evident as well.

It goes without saying that every care must be taken of the patient's general condition, and any other ailments treated seriously by medical or dietetic measures, no matter whether they can be brought into connection with the ear trouble or not. I must here strongly dissuade from applying vigorous hydropathic procedures; but climatic cures are almost always advisable. The patient should only be sent to an altitude varying between 2000-3000 feet, as great height often occasions increase of troubles. Sea air proves itself favourable, notwithstanding that this has often been questioned. Of course it is the shores of the Mediterranean and the southern part of the Atlantic which ought to be chosen, as the climate of the North Sea and the Baltic, with its atmospheric disquietude, is too rough.

Although we have at our disposal quite a number of rational methods of treatment, we must admit that in many cases no results are obtained by them. It is these cases where *surgical intervention* is usually called for as a last resource. This intervention

consists of either intra-tympanic or rhino-pharyngological operations.

I have already said something about the respective value of rhino-pharyngological operations. I firmly believe that as soon as any indications for operations become apparent, from the mere rhinological point of view, the operation should be performed. But these will only be of real value on the ear affection, when, besides the chronic adhesive process, sure signs of a real *catarrhal* condition still exist. We can then hope to stop the actual catarrh. Thus we improve the function at the time, and prevent a further increase of the adhesive changes. I repeat, therefore, that I can only admit of the operations in the naso-pharynx having a prophylactic rather than a curative effect; but this prophylaxis, when dealing with individuals having a disposition to troubles of the middle ear, cannot be carried through energetically enough. For this reason it must extend to even such changes as would rhinologically occasion no incommodation. A special point of pharynx surgery will be referred to below.

Of the endotympanic operations, I have abandoned for the present the one which tries to produce a perforation in the membrane, and to keep it open, as this latter is practically impossible. Dr. Yankauer, from New York, has lately proposed a method of his own to curette the tube, in order to secure persistent perforations. I have not yet been able to experiment on it, as I have only just received Dr. Yankauer's instruments. The dissection of the posterior fold has been attended by good results in cases where, after catheterisation, the retraction is not completely corrected. A lasting result has only been obtained if after this little operation a massage of the mallens by means of a probe (Lucas's) was continued for some length of time, whereby the newly formed scars remain distended.

Tenotomy of the tensor tympani muscle is an operation of the results of which I am very doubtful. In its place, and in the place of other similar operations, I should advise the extraction of the hammer (and eventually the incus). This produces a far more complete disencumbrance of the inner part of the middle-ear chain from the adhesions inserting on the hammer. It appears to me even more promising than the luxation of the hammer, as proposed by Grunert, or the dissection of the ligamentum anterius mallei. I have latterly, in a number of cases, cut through the joint between incus and stapes, after this part had been exposed by a crescent-shaped incision in the membrane, and I have often been

satisfied with the results. The mobilisation of the stapes I consider to be dangerous and useless.

That the success of all these operations is so often satisfactory I attribute to the circumstance that, as I have already mentioned, one resorts to them as a last hope and only if all other therapeutic methods have failed. In cases where a complete obliteration of the tympanic cavity with connective tissue is present, we cannot expect much even from an operation.

We should obtain a larger percentage of improvements if such operations were made—full indications being shown—in cases where catheter or massage are still efficacious, but do not bring us any permanent cure. The dislike for those operations found among many prominent specialists takes its origin certainly from the fact that they were very often performed in cases of chronic catarrhal adhesive processes *and* otosclerosis as well, without due regard as to their pathological difference.

I think that we shall make decided progress once we have learned to estimate the exact influence of the mechanical troubles of the conducting apparatus on the action of the same. A series of experiments has led me to believe that it is not only a question of the dimensions of the adhesive formations, but chiefly of their special localisation. Minor scars, callosities, etc., can therefore produce a far greater diminution of hearing in a certain place than more extensive ones in another. The better we are able by an exact inspection to throw light on the conditions of each case, the greater is our chance of operating successfully. This becomes all the clearer when we face the latest progress made by the direct pharyngoscopy. With Hay's pharyngoscope or similar instruments the inspection of the tube and its surroundings has been made so much easier that where it was previously possible to perhaps occasionally overlook an adhesion, swelling or growth by the post-nasal rhinoscopy, these will now probably attract our attention. With this help at hand we can now sometimes lead up to improvements of the hearing by removing alterations discovered by this method. This might be done in cases where we had not a sufficient ground for operating on before. I believe that this method of direct inspection of the tube has a considerable future before it.

To conclude, I should like to sum up shortly the chief points that I consider important at the moment for treating the chronic catarrhal adhesive processes:

- (1) Careful treatment of the naso-pharynx, especially in children,

and in all cases in which catarrhs of the tube or acute otitis come under our observation so as to prevent a later development of adhesive processes.

(2) Mechanical treatment by air douche, catheter, and bougie, combined with internal use of iodine and extensive application of hot air and steam externally as well as *per tubam*.

(3) Intra-tympanic operations, not only in the most advanced cases, but also where other treatment gives a decided but not lasting relief.

(4) Use of direct pharyngoscopy in order to better detect changes around the ostium pharyngeum of the tube.

Finally, I would like to express the wish that when experimenting new methods of treatment only such cases may be recorded that are absolutely unquestionable as to their diagnosis, and that the records be furnished with the complete functional tests. By this we may reach the position of being able to control the value of different methods on a large and more uniform material. Furthermore, an exact exploration is desirable of the relation existing between the localisation of troubles of the conducting apparatus and the function of hearing. This might lead us to further development of our operative measures.

SOCIETIES' PROCEEDINGS.

BRITISH MEDICAL ASSOCIATION—SECTION OF LARYNGOLOGY, OTOTOLOGY, AND RHINOLOGY.

Meeting at Birmingham, July, 1911.

MR. F. MARSH, Birmingham, *President, in the Chair.*

DISCUSSION ON ADHESIVE PROCESSES IN THE MIDDLE EAR.¹

DR. ANDREW WYLIE (London) said: The leaders of this debate have covered most of the points in this subject, but I am sorry that Mr. Yearsley has given us no definite form of treatment, and Dr. Frey has perhaps given us too many. Mr. Yearsley has mentioned that he considers otologists must combine with electricians to provide some form of artificial aids to hearing, and I agree that the sooner this is done the better. I wish to-day to bring before your notice the treatment of this condition by hot and also hot medicated air. I have been treating such patients for over four years with considerable success. Since the meeting at Belfast my instrument for administering this treatment has been modified and improved. It has a little chamber where drugs such as benzol,

See p. 626, et seq.

menthol or turpentine can be inserted, and the hot air blown through it and through the Eustachian catheter into the middle ear, or externally through the meatus. One great difficulty with this treatment is that the catheter becomes very hot and has to be withdrawn. I tried ivory and gum-elastic catheters without success, but Meyer & Meltzer have made me a catheter of a vegetable fibre which does not get hot and can be boiled and sterilised. Physicians and surgeons have found that heat in any form relieves and cures thickened conditions in joints and other parts of the body. Otologists also know that patients suffering from chronic adhesive processes improve when sent to reside in a dry climate; therefore surely the application of dry hot air to this thickened membrane and hypertrophied tissue in the middle ear should relieve it. I have notes of over 1000 cases, and 420 of these were cases of post-suppurative deafness (all with a thickened membrane and some with perforations). About one third of these cases have been decidedly improved. I do not say cured, but feel convinced if they will continue having the hot medicated air blown through the Eustachian catheter at intervals the improvement will continue. The amount of heat depends on the patient; when the tympanic membrane becomes red its application should cease. All my cases have been catheterised and Politzerised many months before the hot air was applied. I would suggest that all should try this form of treatment.

Dr. W. JOHNSON HORNE (London) reminded his listeners that even in the worst of the cases of deafness under discussion there was a residuum of hearing, and that it was important to give hope, and to encourage the patient to cultivate that residual hearing. Therefore in what appeared to be the most hopeless case one was justified in urging a course of treatment. Otherwise patients were liable to become despondent, and worse than despondent, if the subjective noises became very distressing. It was important also not to lose sight of the general health of the patient, but in prescribing tonics one had to be guided by the blood tension. As regards the treatment of nasal obstruction no one could lay down hard and fast rules about the generality of patients. One indication, however, for nasal treatment was marked relief following the use of the Eustachian catheter; but even should the use of the Eustachian catheter yield a negative result, that was not, in his experience, a contra-indication of nasal treatment being carried out. In all these cases deafness was of much longer duration than the patients realised, therefore prophylaxis and special attention to the naso-pharynx in early life were strongly indicated. It was remarkable and highly suggestive how in some of these cases of chronic dry non-suppurative catarrh the supervention of pus resulted in a marked improvement in hearing. He could call to mind more than one case, but one case in particular, in which suppuration of the ears followed upon influenza in the case of a patient who had been deaf for many years with chronic, dry, non-suppurative catarrh, with the result that considerable credit, quite undeserved, was attached to himself for the improvement in hearing that followed. In fact, it would seem as if a little pus at times was helpful.

Dr. WATSON-WILLIAMS (Bristol) referred to the vascular and lymphatic interconnections between the naso-pharynx, the Eustachian tube and middle ear, and with these one should perhaps include the posterior ends of the inferior turbinates. This interconnection explained the importance of removing the infective lymphoid tissue aggregations in the naso-pharynx we term adenoids, not only when associated with nasal obstruction, but even in the complete absence of nasal symptoms.

provided the middle ear was involved. He felt, too, that when definite mechanical obstruction existed in either one or both nasal passages, their removal in the class of case under consideration was of value, because it tended to get rid of the associated catarrhal conditions. When one had tried and failed to obtain improvement from Politzerisation and other means, and one's thoughts turned to the propriety of removing the drum and malleus, he suggested that it was well first to simply perforate the drum, and if, so long as the perforation remained patent, the hearing power was definitely improved, there was a likelihood that the more complete removal of the drum and malleus would be permanently beneficial. If stapedio-vestibular adhesions were present the removal of a drum could be of little or no use, whereas if they were not present, one could usually obtain improvement from Politzerisation, Eustachian catheterisation, otomassage and so forth, hence the cases calling for removal of the drum and ossicles were few and far between.

Mr. H. F. MOLE (Bristol) had always been sceptical of the use of fibrolysin, and never recommended it, and recently he had seen two cases—one a medical man, who gave himself injections for six months without benefit, and another case carefully tested before the treatment recommended by an aural surgeon in Germany, and three months later, after the treatment, in which no benefit, subjective or objective, had resulted. He asked if it was possible to tell which cases of malleus adherent to the inner wall will be improved in hearing by mobilisation, as he had seen several cases where the malleus had been mobilised and kept freely movable by massage with Siegle's speculum, but in which no improvement in hearing took place.

Dr. W. S. SYME (Glasgow) said: With reference to the treatment of nasal conditions I do not think that the fact of obtaining no improvement by catheterisation should deter us from treating nasal conditions where these exist. Indeed it is a matter of fairly common experience that many of such cases show decided improvement in hearing after appropriate operations on the nose and naso-pharynx. In cases even where there is an amount of hypertrophy of the posterior extremities of the inferior turbinals which does not give rise to nasal obstruction, but which is keeping up some naso-pharyngeal catarrh, this hypertrophy should be removed. The same applies to pathological conditions in the posterior accessory nasal cavities, and with especial force to remains of adenoids. Regarding the length of the piston stroke of the otomasseur, it is my opinion that a longer and stronger stroke should be used after a period of use of the shorter stroke. The increase should be gradual, and of course the condition of the membrane with special reference to the presence of atrophic portions should be carefully observed. The usual electric masseurs do not in my opinion permit of a sufficiently strong stroke. A watch should be kept for phenomena such as vertigo, increase of tinnitus and so on. Fibrolysin I have found useful in post-suppurative changes in the tympanum. The treatment should be prolonged and of course combined with other methods. Probably, however, the fibrous adhesions in ordinary adhesive catarrh do not differ from those found after suppuration. Their formation is probably due to ulceration of the surface of the thickened mucosa. By the apposition of two ulcerated surfaces adhesion is obtained, and ultimately this adhesion undergoes organisation and fibrous formation. It is probable, therefore, that the reason fibrolysin is more valuable in post-suppurative adhesions has to do with the amount of fibrous tissue. A more prolonged use of it might be valuable in ordinary adhesive processes. With regard to climate and altitude in the

treatment of middle-ear adhesive catarrh I have been in the habit of advising a fairly high and dry locality as the best. It is advisable that reference should be made in connection with the deafness of children to the results of medical school inspection with reference to the presence of adenoids and enlarged tonsils. In most of the statistics it will be observed that the proportion of adenoids to enlarged tonsils is absurdly low, and as specialists we know that the proportion is really very much higher. As a result it follows that the tonsils are removed by general practitioners, and the adenoids, to which attention had not been drawn by the medical inspector, and which in most cases are of most importance, and this is especially so with reference to deafness, are left. The results as regards the hearing as well as the general health are, as one would expect, disappointing.

Dr. L. H. PEGLER (London) said he doubted if we knew all that was important to be known about the pathology of non-suppurative middle-ear deafness—that form which could be excluded from otosclerosis in its typical shape, and in which intra-tympanic adhesions were presumed to exist. If true organic changes had taken place in some of the exceptional cases one met with, it was difficult to explain the great relief in the deafness from intra-nasal treatment in such cases. He constantly saw examples, as all did, in which a nasal operation for obstruction restored the hearing apparently by improvement in ventilation and drainage, and on this principle he thought we might make the path for the catheter the criterion. If this could not be effected, or only by causing pain and perhaps bleeding, it seemed advisable that the aurist should by surgical means render the passage of the instrument no longer a matter of inconvenience to the patient. But he would like to refer to a case of curable deafness that had recently occurred in his practice, where catheterism, though done under difficulties, had been satisfactory, but the benefit to the hearing by that procedure insignificant. A gentleman complained principally of deafness in the left ear, so that he could not converse, especially out of doors, with his companion on that side of him. The right ear was slightly affected, but cleared up under inflation. The left-sided nasal obstruction consisted of a contact between the anterior third or more of the inferior turbinal with a horizontal ledge on the septum. The watch was heard just short of contact. Conversation one yard away; bone-conduction not increased. Membrane thin, slightly atrophic. The nasal breathing was not too free, especially at night, though not specially complained of. In May last the anterior portion of the left inferior turbinal was resected under cocaine, and when the patient left the nursing home a day or two later he reported that his hearing was restored, so that he could converse comfortably. An interval then ensued during which the patient left town for the country, but when he returned a month later it was found that the improvement had not been maintained, and the passage in the inferior meatus, which had appeared sufficient at the operation, had not kept clear, owing to redundant tissue formation. A sufficient portion of the stump, therefore, was removed under ethyl chloride, and the air-way permanently cleared, all contact being abolished between septum and turbinal. This happened early in July, and a day or two after this last procedure the normal hearing was once more regained. Hearing for the watch did not exceed half an inch, but conversation in a low voice or clear whisper was heard six yards off with the face turned away. The speaker could not attribute this result to either ventilation, drainage, or change in the lymphatic circulation, but felt inclined to suggest a nervous influence. This could

be effected through Meekel's ganglion, which communicated with the tympanic nerve supply by the facial and glosso-pharyngeal, through the Vidian, and with the inferior turbinal by its palatine branches. Another route would be through the nerve to the tensor tympani from the otic ganglion receiving impulses from the turbinal branches of the maxillary division of the fifth through connection with the mandibular division, joining the former at the Gasserian ganglion. The speaker recalled a somewhat similar result in a young hospital patient, upon whom he had operated for septal deflection and dislocation in two stages, but in whom the aural affection was suppurative otitis media. There might be some analogy between the mechanism in these instances and that of the rapid curative effect of adenoidectomy in the deafness of children, which was not yet understood. We were also familiar with the good effect of operations for nasal obstruction upon asthenopia and referred head pain, which was obviously due to nervous influence. The speaker concluded by extolling the air-reservoir apparatus as an aid in catheterising obstructed Eustachian tubes, especially when the air was medicated. He also heated the compressed air in cold weather by means of an electric coil made for him by the Sanitas Company, but he could not understand, as a pathologist, how hot air could affect genuine fibrous adhesions, and thought some other explanation for the benefit derived from warm and moistened vapour must be sought.

Dr. BRONNER (Bradford) said that most people had off and on attacks of middle-ear catarrh with or without consequent adhesive processes. It was therefore very important that these attacks should be prevented by general treatment. Sleeping in rooms with open windows without adequate covering of the head was a very common cause of nasal catarrh and middle-ear disease. Local hyperæmia was the best method of preventing contraction of the tissues in the middle ear. Hot air by the Eustachian catheter or external meatus, and suction from the external meatus controlled by the speculum were most useful. Elderly people should take iodide of potassium for long periods of time; this not only prevented the formation of connective tissue so common in old people, but regulated the blood-pressure and improved the tinnitus. In many cases the nebuliser (with iodine, menthol) attached to the American compressed air apparatus and the catheter was very useful, as it cured the catarrh of the Eustachian tube and of the middle ear.

Dr. DAX MCKENZIE (London) said that a number of methods of treating these conditions by the induction of hyperæmia were in vogue. The hot-air treatment had already been mentioned. In addition he himself had recently been trying the effect of Bier's treatment by means of an elastic band round the neck and had found improvement in some cases. He had heard several speakers say that they did not try certain methods of treatment (the removal of nasal spurs, etc.) because they did not see how any benefit could arise from them. This, he submitted, was an injudicious mental attitude in the case of a disease the ætiology and pathology of which were not exactly known to us. The wiser plan was to try all the methods proposed without prejudice. He agreed with Dr. Frey with regard to the beneficial effects of coarse vibration applied to the spine or skull in the treatment of tinnitus. He concluded by an appeal for the prompt and early use of artificial aids to hearing in order to prevent or postpone the inevitable atrophy from disuse of the nerve elements in the labyrinth or brain.

Mr. G. SYDENHAM asked if anyone had tried the method of introducing medicaments into the middle ear by means of direct hypodermic

injection through the membrana tympani, which method he thought more exact as regards the certainty of introduction of a definite quantity. He had tried fibrolysin amongst others injected in this way, and thought in a few of the cases that a definite improvement had resulted. In only one case had suppuration followed, and this was due to faulty technique, though, strange to say, in this case the hearing improved.

MR. HERBERT TILLEY (London) said that his experience as to the probability of cure or relief of deafness in the class of case under discussion depended almost entirely on the result of inflation of the middle ear by the air-bag or by means of the Eustachian catheter. If such means produced an immediate improvement in the hearing, even though slight, then any pathological defects in the nose or naso-pharynx should be dealt with, the general health of the patient cared for, and a good result anticipated. If, on the other hand, no relief of the deafness followed inflation, he much doubted the value of any intra-nasal treatment so far as the ear was concerned, although removal of nasal obstructions or pathological conditions of the naso-pharynx was often productive of much relief to the patient in so far as those regions were concerned. The patients often expressed themselves as "much better," but if we carefully compared the capacity of hearing before and after such operations it would generally be found that the hearing remained the same, especially when the comparison was made weeks or months after the treatment had been carried out. In his experience this result applied to all forms of treatment, *e. g.* injections of sterilised oils or alkaline fluids into the tympanic cavity, electro-massage of the membrane by an air column, the use of the Eustachian bougie, fibrolysin, or surgical intervention. He had had no success with fibrolysin, and thought that great care should be used before otologists made statements as to its value. He himself would like to see an external scar or a Dupuytren's contraction cured by fibrolysin, and then it would be easier to conceive that it might be useful in adhesive conditions in the complicated cavity of the tympanum, where many other factors had to be taken into consideration. He thought the various otological societies would render excellent service if members who had the time would collect some half dozen cases of deafness due to adhesive conditions in the middle ear, allow them to be carefully tested by two or three other members, and then submit such patients to any of the various modes of treatment which had been advised, and finally, after three to four months, have the hearing again tested. By such means we should soon obtain definite results of positive or negative value. He had used the bougie treatment in cases where the Eustachian tube was obstructed, and had come to the conclusion that if the tube was much narrowed and had been thus constricted for six to ten months, no amount of dilation would ensure permanent patency or relieve the accompanying deafness, at any rate for more than a few hours.

DR. J. GRIB WISHART (Toronto) had been accustomed to apply heated air for a number of years in selected cases, and in many instances with marked benefit. The compressed air was supplied from a tank and not with a hand-bulb, thus more thorough application to the tympanic cavity was secured. As he had experienced the difficulties with the over-heating of the catheter related by Dr. Wylie, he would be glad to give a trial to the fibre catheters recommended. Dr. Wishart had seen the Holmes pharyngoscope demonstrated by its inventor in Atlantic City recently, and the picture obtained of the mouth of the Eustachian tube and its adjacent parts was a revelation. No matter how skilfully the rhinoscopic mirror were used, the picture obtained could never be exact

owing to the relative positions of the canal and the mirror. A knowledge of the exact condition of the mouth of the tube and the fossa of Rosenmüller was essential to a full understanding of the course to be followed in treatment, and it might well be that the treatment would be revolutionised by the further use of the Holmes pharyngoscope. It had one advantage that should be emphasised, in that while it was introduced through the opposite nostril, all instrumentation could be made directly under the control of the eye.

Mr. HENRY J. DAVIS (London) said that the evidence in favour of treating nasal abnormalities in cases of deafness, such as that under discussion, was overwhelming. One saw cases every day where hearing was benefited by so doing. If nasal ventilation was not free hearing became impaired, and why should it be otherwise? So simple a remedy as an alkaline spray would improve patients by clearing the nose; they would volunteer the statement themselves. Regarding intra-tympanic fluid injections through the Eustachian catheter, for three years he had made observations on the results of this treatment. He could not go into the matter now, but briefly he would divide these under four heads: (1) Injections of fluid (diluted aqua menth. pip.); (2) injection of alkaline fluid (lotio alkalina); (3) injection of acid fluid (lactic acid 5 per cent.); and (4) oily solutions (aqual, benzol-aqual, paroline, with or without menthol). His conclusions were that the greatest temporary improvement was obtained by No. 2, but that patients would often benefit by the acid solution injections when they did not improve with the others. In oily solution No. 4 improvement was sustained for a longer time, and this is what one would expect, as the oily solutions were not so readily absorbed. If the tympanic cavity was dry conduction was not so perfect as if it was moist. He agreed with Dr. Brønner that iodide of potash was of great value in some cases, not merely because it produced absorption of tissue, but because it made the tympanic cavity moister; to old people gr. iij a day would suffice.

The PRESIDENT, in summing up, thanked the introducers for the comprehensive way they had dealt with the subject. They were specially indebted to Dr. Hugo Frey, of Vienna. There seemed to be general agreement that if improvement was obtained by inflation, any nasal or naso-pharyngeal condition interfering with drainage or aëration should be dealt with, and a number of the speakers were in favour of this procedure even if no improvement followed inflation. All were agreed upon the importance of prophylaxis. It seemed at present that intra-tympanic injections and massage must be looked upon as the mainstay of treatment. Hot air would probably be more extensively employed after the good results reported by Dr. Andrew Wylie and the exhibition of his improved and very portable apparatus. The position of operative treatment remained practically the same—there had been no great advocacy for it, and the results obtained seemed variable. It was generally felt that a more accurate diagnosis and more careful record of cases were desirable before definite indications could be laid down. The members were agreed that more attention should be given by otologists to aids to hearing, and he was glad to hear that the opener of the discussion (Mr. Macleod Yearsley) was making experiments in conjunction with a skilled electrician.

Mr. MACLEOD YEARSLEY, in reply, said: I am glad Dr. Frey has not hesitated to deprecate loose diagnosis and insufficient clinical data. It is impossible to be too careful in relating cases in which new treatments have been tried. I am also pleased to hear him say that prophylaxis is

as important as later treatment: I believe that it is even more important. In reply to Dr. Wylie, I do not think he is justified in saying that I put my foot down on *all* treatment. I think I indicated those methods which are established as of proved efficacy, and dwelt most upon those whose value is doubtful. I am especially interested in Dr. Wylie's hot-air apparatus, but I am doubtful as to the wisdom of using turpentine: is it not possible that the inflammatory reaction set up may result, later, in further adhesive processes? In reply to Mr. Mole and one or two others, I have found mobilisation useful. I have only done it in a limited number of cases, which showed the malleus was absolutely fixed, with plus bone-conduction, and when the deafness has not been of long standing. The improvement has been marked. As regards fibrolysin, I recently asked a distinguished general surgeon as to his experiences. He told me that, in Dupuytren's contraction, it was best to divide the adhesions and rub the drug in. This may explain Dr. Sydenham's good results. I think that, as to length of the piston stroke in using otomassage, I have been influenced by continental warnings as to the danger of damage to the stapedia-incudal joint. I agree with Dr. Syme that a dry, moderately high climate is best suited for these cases: in the majority of them the neighbourhood of the sea is contra-indicated. I can assure Dr. Pegler that electrical aids are becoming cheaper: one which has just appeared only costs £2 10s. I may say that I have met with an expert telephonist with whom I am going to work at these instruments after the vacation. Dr. Brommer doubts the effect of small spurs. Surely they act by impairing nasal drainage, so that nasal secretions can set up a catarrhal condition by constant irritation. I would like to suggest to Dr. McKenzie that the domain of the pure otologist depends upon one's idea of the locality of the opening of the Eustachian tube. Some American otologists have asserted that it is at the tip of the nose. The explanation of Dr. Tilley's hypothetical case lies, I think, in the fact that the nasal operation acts in two ways—by improving the air-way and so the general health, and by arresting the process. As regards the electric nasopharyngoscope, I indicated in opening the discussion that I believe it will prove a valuable aid both to diagnosis and treatment.

AUSTRIAN OTOLOGICAL SOCIETY.

June 26, 1911: Monats. f. Ohren., year 45, No. 8.

PROF. V. URBANTSCHITSCH *in the Chair.*

Abstract of the Proceedings.

FOUR FURTHER CASES OF COMPLETE UNILATERAL DEAFNESS AFTER SALVARSAN.

By O. BECK.

CASE I. A man, aged twenty-one. Definite lesion. Wassermann positive. Examination of the ears showed their condition to be normal. February 16, intra venous injection of salvarsan. Next day, rigors. Vomiting, headache for two hours. Moderate Herxheimer. On the 19th the sore was healed over. February 24, 0.4 grm. again of salvarsan intra-

venously. Wassermann positive. No reaction followed, and on March 7 Wassermann was negative. April 4, patient complained for some days of a dizzy feeling. Nothing abnormal discovered on examination. Wassermann negative. April 4, giddy attacks ceased, but there was pain in right ear. Spontaneous nystagmus to the left, hearing normal, vestibular response normal. June 6, patient complained of noises in the ears for the last three weeks. Palmar and plantar psoriasis, both sides. Complete deafness right side; left normal. Both vestibules react normally. June 6, another 0.4 gm. of salvarsan injected. No improvement in the deafness up till present date.

CASE 2.—A man, aged twenty-six, had acquired lues in November, 1910; treated with immunction and injection of salicyl. March 17, 1911, secondary eruption and intra-venous injection of 0.4 gm. salvarsan. Hearing perfectly normal, slight tubal catarrh. April 1, salvarsan 0.4 gm. as before. Wassermann negative. May 14, patient complained that for the last eight days he had heard badly in the left ear. Tenderness over the right zygoma. May 11, severe headache and deafness. Examination showed complete deafness left, ptosis of the right eyelid. Spontaneous nystagmus to the right, some indefinite unsteadiness. Vestibules responsive. Three days later slight nerve deafness on the right as well. Two days later still, left facial paresis. June 20, intra-venous injection 0.4 gr. salvarsan. No improvement noted up till date, but some right oculomotor paresis in addition.

CASE 3.—A woman, aged twenty-six. Infection in the early part of 1910; treated with mercurial injections and potassium iodide. January 27, secondaries. Eyes and ears normal. February 1, intra-venous injection 0.3 gm. salvarsan. No apparent reaction, no Herxheimer. February 5, 0.5 gm. salvarsan, intra-muscular. By February 8 the rash had almost disappeared. The patient, however, complained that some six weeks after the injection she began to hear badly in the left ear and that this deafness was increasing steadily. June 19, the left ear was found to be completely deaf. The right ear normal, and both vestibules were responsive. Intense tinnitus preceded the deafness in this case.

Beck also announced that the condition of the two other similar cases shown by him at the last meeting had remained unaltered.

CASE 4.—*Deafness on the Left Side with De-preciation of the Hearing on the Right after Salvarsan. Remarkable Condition after a Further Injection.*—A butcher, aged forty, applied for treatment of secondary symptoms on March 7; infection some two months previously. Right ear normal, left, slight tubal catarrh. Wassermann positive. March 3, intra-venous injection salvarsan 0.4 gm. Herxheimer. March 28, injection repeated. April 23, tinnitus for the last five days. Some suggestion of nystagmus. Wassermann negative. Four days later a bilateral hesio auris int. could be demonstrated. The hearing became worse, and on May 18 the left ear was found to be totally deaf, slight facial paresis right, vestibules responsive. May 23, Wassermann negative; intra-venous injection salvarsan 0.4 gm. Six days later the hearing on the right was C.v.¹ at $\frac{3}{4}$ m. and Whp.¹ a.e., whilst loud shouts could be heard in the left ear, till now quite deaf at 15 cm. At later examinations the hearing on the left side varied between loud C.v.¹ at 25 cm. and total absence of appreciation. (Beck considers that the improvement on the left side was due to the second injection but gives no reasons for this opinion, and variations in the range of hearing in cases of affections of the auditory nerve are by no means uncommon.)

¹ C.v. = conversation. Whp. = whisper.

EXPERIMENTAL ALCOHOL INTOXICATION.

BY R. BÁRÁNY.

Some experiments in this direction were first carried out, said Bárány, in 1825 by Flourens on animals, by which he showed the effect of this drug on the cerebellum. Bárány had lately made some investigations into the vestibular condition of chronic alcoholics and patients with delirium tremens, but as to the results thus obtained he wished at present to refrain from speaking, since he had not yet completed his observations. He had, however, thereby been filled with the desire to investigate the state of acute alcoholism, for which purpose four students had, "in a most praiseworthy manner," put themselves at his disposal. Accurate data were first obtained as to the presence of spontaneous nystagmus and the condition of the pointing tests, vestibular reactions, etc. All the cases were first examined to be sure the tympanic membranes and hearing were normal.

Some 250 to 300 gm. of brandy were then drunk in the shortest possible time—about half an hour—and the tests then at once commenced. No bad effects occurred and the men were all quite fresh the next day, probably owing to the fact that at the end of the tests vomiting took place. Bárány had made many important observations and hoped some time to publish them in detail; meanwhile he would only relate the main points:

(1) A slight degree of spontaneous nystagmus appeared. (2) Sudden jerking of the head evoked nystagmus—to the right when the movement was made to the right and to the left when it was to the left. This was generally accompanied by a slight amount of giddiness. (3) The duration of the nystagmus produced by rotation was not altered. (4) The sensation of movement during rotation was considerably depreciated. (5) No alterations of the spontaneous pointing reactions were noticed. (6) Spontaneous tendency to fall occurred mostly independent of the spontaneous nystagmus and of the position of the head. (7) The reaction movements of the upper extremities were diminished—in one case completely absent. (8) Abnormal reaction movements and abnormal sensations as to rotation were noted bearing no apparent relation to the stimulus adopted, although always varying together.

Bárány concluded that acute alcohol poisoning produced a paralyzing effect on the cerebellum, and in addition considered that the constant and parallel variation of the sensation of movement and of the pointing reactions together—the deviation always being in the opposite direction to the sensation of movement—indicated their representation in the brain as being situated in one and the same area, namely, in the cerebellar cortex. It was further probable that the sensation of rotation was conveyed direct to the cerebral cortex by fibres *via* the vestibular nucleus, the route of which, however, was at present unknown. Still, certain connections between the cerebellar cortex *via* the anterior peduncle and red nucleus to the cerebral cortex of the same side and to the spinal tracts of the opposite side were known, and it was possible that these sensations and reactions followed these paths. Mulder had found that the sensation of movement was experienced very much later than the appearance of nystagmus, which would seem to support this idea, and suggest that prior to the sensation being received in the cerebral cortex action had already taken place in the lower centres. Further, the sensation of rota-

tion was related to both the direction of the nystagmus and the position of the head, as Bondy, Neumann and Breuer had already shown, all of which went to support his theory of the location of the centre for these functions in the cerebellar cortex and the representation of the sensation of movement in the surface of the large brain. *Abstr. R. Tweedie.*

PROCEEDINGS OF THE AMERICAN LARYNGOLOGICAL, RHINOLOGICAL, AND OTOLOGICAL SOCIETY.

Seventeenth Annual Meeting, Atlantic City, June 1, 2, and 3, 1911.

Report by DR. L. M. INGRAM.

Thursday, June 1, 1911.

(Continued from p. 543.)

REPORT OF A CASE OF OPTIC NEURITIS BENEFITED BY OPERATION ON THE SPHENOID AND THE POSTERIOR ETHMOID.

By DR. HARMON SMITH (New York City).

Unmistakable evidence of the favourable outcome of operations upon the sinuses for the restoration or betterment of sight have been furnished by Onodi, Posey, Holmes, and others. It may reasonably be concluded that in cases of optic neuritis, where all other causes have been eliminated, operation upon the sinuses will prove successful in a large proportion of cases, provided the neuritis has not extended over too long a period. In cases where the most beneficial results were obtained there was but slight local evidence of involvement of the accessory sinuses. The author considered it unquestionably justifiable to operate on these sinuses when every other possible cause of the neuritis had been eliminated, even when there was no local or intra-nasal evidence of the existence of an empyema. Such interference might be justified as an exploratory operation. The mere depletion, incidental to the operation, would in itself prove of value if the neuritis was due to the pressure of a diffuse inflammation. Pressure either upon the nerve itself or upon the nutrient vessels supplying the nerve would occasion visual disturbances, so that relief of pressure, whether it was due to empyema, periostitis, or hyperæmia from nasal congestion, was the object to be kept in view by the rhinologist. This could be promptly attained only by operation. Milder operative procedures have proved ineffectual in this regard.

The author's method of procedure is to remove the middle turbinate with the cold snare, remove the lower and anterior walls of the posterior ethmoidal cells with forceps and curette, enter the ostium of the sphenoidal sinus with a probe, and curette away the anterior wall from this point downwards, until sufficient space is made to employ sphenoidal forceps, when the entire wall, or enough of it, can be removed to determine whether there is any necessity for a more radical exposure of the sinus. Drainage is all that is demanded in the majority of cases. If granulations exist it is better to remove them with forceps than to curette the sinus. Post-operative packing will further reduce the

granulations present, as well as prevent their recurrence. In the absence of granulations the author does not use packing, but sprinkles over the denuded area a few granules of thrombo-kinase, which controls the hæmorrhage and does not prevent drainage. The after-treatment consists in preventing the formation of granulations by the use of fused nitrate of silver on a probe, or cutting them off with forceps, and in keeping the nose clean by douching with some alkaline solution. The eye-symptoms should begin to show improvement within a week if the diagnosis has been correct and the operation successful. He has also operated upon a number of cases with lesser disturbances of vision, with good results in the majority of instances. In several there was no improvement. Upon the whole, however, he felt justified in advocating operative measures for the relief of optic neuritis in the absence of other known causes, and when there are no contra-indications for operation.

DR. LEWIS A. COFFIN (New York City) said he had been interested for the past year or so in studying the visual field in the class of case under discussion, and had had every case investigated from this point of view as well as the fundus condition. In this connection he had read with interest a late paper by Wallis, of Shrewsbury, published in the JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY, for May, 1911. With reference to the ætiology of field affections, Wallis was quoted as saying—"Ophthalmoscopic changes are a far more common symptom in posterior sinusitis than in the anterior, as is to be expected from the close proximity of the nerve to these cavities. . . . This is explained by the assumption that the optic nerves are directly involved by a toxic substance which has soaked through into the optic canal and orbit from the sinuses." The speaker did not agree with Wallis with reference to the soaking through of any toxic substance to the sinuses; he did not think that there is any toxic principle that acts directly upon the nerve to destroy its function, but rather that this is entirely circulatory. The venous return from the anterior cells is such as not to interfere with the optic nerve, whereas the venous return from the posterior cells is such as to interfere with the venous return of the optic nerve. This it is which gives rise to the œdematous condition. This would seem to be borne out by the fact that in disease of the frontal and anterior cells there is œdema of the adjacent tissues. On the other hand, there may be orbital cellulitis and œdema of the orbital part of the head, while the vision remains the same, unless there is great pressure. The idea of this toxic principle must be borrowed from the oculists, who have recognised and described a toxic amblyopia attributed to alcohol, tobacco, etc.

Dr. WORTHINGTON said that a brief report of the following case would be of interest: A Pole, aged twenty-six, applied on November 29, 1910, at the Baltimore Eye, Ear and Throat Charity Hospital, complaining that the left eye had suddenly become blind two weeks previously, since which time there had also been headache and some dizziness; no vomiting. The right optic disc was perfectly normal and the vision perfect. The left eye showed an optic neuritis of the choked-disc variety with two dioptres of elevation. The margin of the disc was completely lost, the veins were markedly dilated and tortuous, the arteries attenuated, and there were numerous flame-shaped hæmorrhages. There were no other symptoms pointing to cerebral trouble, and the patient was very comfortable at the time. There was no history or evidence of lues. Examination of the nose showed evidence of chronic, non-purulent ethmoiditis; on the left side a large middle turbinate completely filled the space between the outer wall and the septum; there was yellow mucus about middle

turbinate. Diagnosis: Bilateral hyperplasia of the ethmoidal cells. The patient, who had been on helmitol, was given ten-grain doses every two hours through the day, and was operated upon under cocaine. The middle turbinate and ethmoidal labyrinth of the left side were removed together with what appeared the anterior sphenoidal wall. The inferior turbinate was likewise removed. There was a free opening into the frontal sinus. No pus was found, nor any evidence of necrosis; but the ethmoidal cells appeared to be distended and filled with some firm substance. The cell supposed to be the sphenoidal contained a few drops of thick yellowish mucus. He recovered rapidly from the nasal operation. There was marked improvement in the ocular condition after the operation. In three days the neuritis became distinctly less marked. On December 13 the patient could count fingers at a distance of several feet. On December 20 the vision of the left eye had risen to $\frac{20}{30}$, and there was marked improvement in the condition of the papilla. The swelling had almost entirely disappeared, and the inflammation was very slight. No elevation could be made out. The margin of the disc was becoming well defined. The patient was discharged with almost perfect vision in the left eye. He returned a fortnight later with complaint that the right eye was beginning to trouble him. At this time the left eye appeared perfectly normal and vision $\frac{15}{20}$; but the vision of the right eye, which had been previously normal, was $\frac{20}{40}$, and there was now the same picture in this eye which had previously been noted in the left, namely, a marked optic neuritis, but not as intense as in the other eye, and without hemorrhages. There were no other cerebral symptoms accompanying trouble. The patient was again admitted to the hospital, but for purposes of observation only, and was placed upon helmitol so as to reproduce the condition under which he had been placed during his previous stay, but without undergoing the nasal operation. He went through the same course. The inflammation rapidly subsided, and disappeared entirely with complete restitution of vision. He was discharged with vision right eye $\frac{20}{40}$, left eye $\frac{20}{30}$. The rapid and complete disappearance of the optic neuritis in the left eye following almost immediately after the nasal operation seemed to corroborate the diagnosis first made that the neuritis was due to nasal trouble. The course of the neuritis in the right eye, however, shows that this view was erroneous. It is not impossible that the rapid improvement in both eyes may have been due to the helmitol, which was given in large doses during the whole period of his stay at the hospital.

DR. WOLFF FREUDENTHAL (New York City) reported two cases. The first was a man, aged thirty-five, who consulted him two and a half years ago at the suggestion of his ophthalmologist. He could not see very well on the right side. Examination revealed empyema of the sphenoidal sinus, radical treatment to prevent loss of eye-sight was recommended. The patient disappeared, and did not return for two years. When he came back the sight on the right side had entirely disappeared, and on the left side it was materially weakened. He had had nothing done in the meantime. One year ago the ophthalmologist examined him and found the left eye perfectly well. The speaker removed the posterior ethmoidal cells and the anterior wall of the sphenoidal, and the patient said he was easy in the head for the first time. The suppuration of the sphenoidal sinuses was not yet cured.

DR. NORTON L. WILSON (Elizabeth, N.J.), referring to the question of the possibility of direct pressure producing optic neuritis, called attention to a case which he reported five years ago. The frontal and

ethmoidal sinuses were involved, and when he performed the Killian operation he found that the abscess had broken through the wall into the orbital cavity, causing pressure upon the optic nerve.

Dr. FRANK ALLPORT (Chicago) said that one of the previous speakers seemed to feel that ophthalmologists were not at all accurate in their diagnosis of toxic amblyopia. In reply to that, he said that scarcely any eye disease was so easily diagnosed as that resulting from alcohol or tobacco poisoning, the symptoms of which were so characteristic that they could scarcely be mistaken.

Dr. SMITH, in closing the discussion, said there might be circulatory disturbance without a purulent condition adjacent, but there could not be a purulent condition present without circulatory disturbance. Referring to remarks concerning anti-syphilitic treatment, he said all his cases had had that treatment. In his cases the condition was progressive, and he could not wait until the patients were thoroughly under anti-syphilitic treatment. He had one patient who could see on the day before the operation, and who could not see at all on the day of the operation, thus demonstrating the rapidly progressing disturbance. With this progressive condition, where all other possible causes have been eliminated, one should not hesitate to go in and relieve the pressure, no matter to what the pressure was due.

PRESERVATION OF THE ANTERIOR WALL IN THE RADICAL EXTERNAL FRONTAL SINUS OPERATION.

By Dr. THOMAS J. GALLAGHER (Denver, Colorado).

The older operations consisted in the removal of more or less of the anterior wall, with or without enlargement of the fronto-nasal canal. In some instances the sinus is packed, and allowed to heal by granulation. Instead of removing the anterior wall an osteoplastic flap has been used by some operators, deformity being thus obviated. All these methods are open to the objection that the ethmoidal cells are practically ignored, re-infection being apt to occur, and more or less deformity to result. The Killian operation has proved effectual, the only objection being the resulting deformity. In the author's opinion the lower portion of the Killian operation should be performed first, preserving the anterior wall, unless it is found impossible to satisfactorily remove the *débris* from the sinus from below. He had performed six external operations in which the anterior wall was preserved, the procedure below being a typical Killian. The size and contour of the sinus should be ascertained by X-ray photographs.

Dr. H. HOLBROOK CURTIS (New York City) said that it was very easy to break down all the ethmoidal cells, and by means of the instruments employed by Ingals, Myles, himself and others, to remove the structures rendered fragile by the inflammatory process and efficiently drain the sinuses. The removal of the middle turbinate, all the ethmoid cells, and the laying open of the entrance to the sphenoid is easily done in fifteen minutes under cocaine anesthesia. Until recent times it was thought necessary to remove the inferior wall of the frontal to do this. The future would show much fewer external sinus operations; there would be hardly any if the specialist got the cases in time.

Dr. ROSS HALL SKULLERS (Philadelphia) said the preservation of the anterior wall, as Dr. Gallagher himself stated, is not a new idea, and it would be merely a useless repetition and waste of time to attempt to

apply it to all cases of frontal sinusitis requiring an external operation. It is the general consensus of opinion that it is inapplicable in the majority of cases on account of the numerous fistulae which follow. Von Eicken, while Killian's assistant, in summing up the results of the Freiberg clinic for eight years, laid particular stress upon this point. He had seen many cases of fistula formation after leaving the anterior wall intact, sometimes several years after the operation, requiring subsequent surgical intervention. In certain well-selected cases this form of operation might, however, be indicated, those, namely, in which the sinus does not extend high in the frontal bone, and is of regular contour. In other words, one in which we can reasonably expect complete obliteration by the ascension of the orbital fat. If recesses and hollows remain which have not been thoroughly reached, failure more or less complete will certainly result. Ritter (*Deutsch. Med. Woch.*, 1906) at one time supported this infra-orbital method and the sparing of the anterior wall, but he has since abandoned the procedure after having reported two deaths following its application.

Dr. D. J. GIBB WISHART (Toronto) said he was in Vienna when Killian reviewed his cases, some of them having been operated upon two years before they were reported. He had seen these cases, and had been impressed by the absence of deformity.

Dr. WALTER A. WELLS (Washington, D.C.) cited a case which illustrated the natural tendency of frontal sinus disease to recover. The case presented all the symptoms which urgently indicate radical operation, and he performed the Killian operation, when he found a complete breaking down of the septum. He did not think it wise to do a double operation, but anticipated having to do the other side later. Not only did the side operated upon clear up completely, but the other side also, and there had been no return of the symptoms during the two years which had elapsed since the operation.

Dr. GALLAGHER, in reply, said that he never resorted to the external operation until after the intra-nasal operations had failed. He believed the lower Killian operation would succeed in most instances, thereby saving the anterior wall and preventing deformity.

ACCESSORY SINUS SUPPURATION IN SCARLET FEVER.

By DR. THOMAS HUBBARD (Toledo, Ohio).

Nearly all cases of scarlatina having so-called "purulent rhinitis," have sinus suppuration in varying degree of severity. Some die from this cause, many recover spontaneously, and between these two extreme groups there is a class which presents distinct indications for surgical treatment. The very severe type usually die from meningitis or septic thrombosis of the venous sinuses with metastases, and chronic suppuration with complications, necrosis and fistula formation, is the fate of those having sinus suppuration of moderate degree of severity unless aided by timely surgery. All of the exanthematous diseases should be regarded as initial causative factors of acute and chronic nasal and sinus suppuration, and these cases should be treated by the rhinologist during the acute stage with the purpose not only of preventing ear infection but also of preventing sinus empyema, which terminates at best in chronic suppuration. As a general rule the same surgical axioms apply in accessory sinus suppuration with symptoms of septic thrombosis as are applicable to mastoiditis. The author reported a case of scarlet fever complicated

by purulent mastoiditis, the suppurative sinusitis involving the frontal, ethmoidal, and maxillary sinuses. Recovery followed operations. Auto-genous vaccine treatment was begun on the fifth day after the sinus operation because of increasing fever, pus, etc., and seemed to establish a decided change for the better.

Dr. HENRY O. REIK (Baltimore) said he had been impressed by two features of scarlet fever cases. The first is the ignorance of general practitioners concerning the relationship between infectious diseases and the accessory nasal sinuses. The second is the ignorance of rhinologists on the same subject. The ignorance of the general practitioner is more excusable than that of the rhinologist. The otologist has been hammering away at the subject so long that the men in charge of these hospitals have come to be pretty keen in regard to the association of scarlet fever and middle-ear disease. They are awake to the possibilities of involvement of the tympana and mastoid, and do not wait long before either acting themselves or consulting a specialist. With regard to the nose it is different. The attending physician has not been impressed with the importance of nasal infection in scarlet fever, and has been allowed to believe that if infection occurs it is partly his fault, hence he is less likely to report it. Infection of the nose is not necessarily the fault of the physician, any more than is infection of the ear, but the text-books often lead general practitioners to think so. It is important to bear in mind how frequently chronic rhinitis of a purulent character, or involvement of the sinuses, may be traced to scarlatinal infection. In most infectious disease hospitals scarlatinal cases are not allowed to leave until the purulent otological condition has been cured. This does not apply, however, to the rhinological region, patients often being allowed to go out while still subject to a purulent discharge from the nose.

THE TEACHING OF OTO-LARYNGOLOGY IN UNDER-GRADUATE AND POST-GRADUATE MEDICAL SCHOOLS.

By DR. S. MACCUEEN SMITH (Philadelphia).

The object of medical instruction to the under-graduate should be the development of a well-rounded, general medical examination, and although the teaching of specialities embraces a very important part of this comprehensive plan, we should clearly differentiate between the instruction necessary for the under-graduate and that necessary for the proper equipment of the post-graduate. The author presented four reports of the methods of teaching oto-laryngology to the under-graduate in sixteen institutions in the United States and two in Canada. In the majority of these medical schools didactic lectures have been virtually abandoned, the instruction being almost wholly clinical. The greater number also confine their teaching to the fourth year. In the two Canadian schools, which have a five-year course, the subjects are taught in both fourth and fifth years. Only seven schools made the definite statement that final examinations are required in these branches, although the various reports would indicate that an examination, if not held by the respective Chairs, is included in the general examination in medicine and surgery in the remainder. It appears, further, that the under-graduate is very much better taught, for his purpose, than the post-graduate. Apparently much remains to be accomplished in post-graduate teaching, both as to methods and system, as well as a more comprehensive classification of students and their needs. The short-

comings in post-graduate instruction are emphasised in one communication, the author of which said, "Post-graduate teaching in America is very unsatisfactory."

Dr. JOSEPH H. ABRAHAM (New York City) confined his remarks chiefly to post-graduate work. In under-graduate schools the teaching of the normal anatomy of the nasal cavity is very deficient. In the teaching in post-graduate schools certain difficulties might be enumerated. First, the average student comes to take a special or general course, the length of which is usually about three months. Secondly, he desires to see the professor operate, and does not care to listen to didactic lectures. Thirdly, the minute anatomy of the upper respiratory tract is practically unknown to him. Fourthly, histology is almost entirely unknown to him. Furthermore, physicians come to prepare themselves for a speciality who are not able to handle instruments for examinations, especially the head mirrors, the rhinoscopic and laryngeal mirrors. They cannot make a rhinoscopic examination. The course which the speaker endeavours to give is, first, operative upon the cadaver, the classes being limited to four students. This costs fifty dollars, which they seem to consider expensive. Six bodies are used in the course. Eight lectures, of about an hour and a half each, are given with this part of the work. Before this operative work is given the gross anatomy is demonstrated upon various cut sections. The majority of students consider this course too high, and do not take it. After the anatomy lessons are finished the clinical work is taken up. The histories of the patients are carefully gone over, the various pathological lesions pointed out, and the diagnosis made. This does not seem to attract the students. At this stage of the instruction as few operations as possible are shown, as they are not prepared to benefit by them. The histology and pathology should, in the meantime, be given in a special course. The students are then given patients to treat. The deficiency in ability to handle instruments is now discovered. Many of the men cannot examine the nose or larynx, they cannot even control a head light. After they have mastered the methods of examination, the handling of the instruments, and the diagnosis, they are then given minor operations. The chief aim of most of them is to do a submucous operation, and to remove adenoids and tonsils.

Dr. WENDELL C. PHILLIPS (New York City) regretted the use of the term "post-graduate." It should be called "advanced medical education." Teachers in post-graduate institutions have to deal with two general types of practitioners: First, those who feel the need of higher medical instruction in order to be able the better to conduct their own work as general practitioners; secondly, those who desire to lay the foundation for specialising in the various branches of medicine and surgery. The two classes of practitioners require different teaching. The post-graduate institution should meet this demand. At the New York Post-Graduate Medical School and Hospital this demand has been met. In the department of otology and rhinology the general practitioner is permitted to attend the clinical lectures of the teachers and all operations and demonstrations, and is encouraged to examine all cases and to draw upon charts their findings. With special reference to otology, Dr. Phillips spoke of the deplorable ignorance of the average medical man, despite the fact that an unusually high order of physicians attend the courses. Very few of them have ever seen a drum membrane with reflected light. He laid great stress upon the teaching of otoscopy, first showing the normal drum membrane, with its landmarks, etc. When the student has learned this, he is then taught the pathological conditions.

after which he is allowed to witness operations. This course is covered in from three to six months. Dr. Phillips hoped he would never hear again that it is the aim of post-graduate schools in this country to send out specialists after from six weeks to three months' instruction. In the above school special students are distinctly told that they should not attempt to practise without giving from one to two years to prepare for it. The number of men who come prepared to devote a year or more to such special study is increasing year by year. He had become convinced that in both under-graduate and post-graduate schools the tendency is to swing too far away from didactic teaching. He considered this a mistake, and in his post-graduate work he gives each year a few didactic lectures on the diseases of the ear. The gross and minute anatomy, physiology, pathology and histology of the ear are taught in special courses, and these are taken by the majority of the students. They are also given a special course in the operative surgery of the ear. Each student performs the entire list of operations on the cadaver. It is the custom in the post-graduate school, after a man has taken all these courses and has witnessed all the operations, to permit him to operate upon the living subject, under the immediate supervision of a professor. For this a special fee is charged. Courses on the living are also given in other departments of the school. It is very encouraging to the practitioners throughout the country to know that they can receive this kind of instruction. In order to accomplish the work just outlined, the proper hospital equipment is necessary. In no country are there better hospital facilities than in America. He regretted that any post-graduate institution gives certificates unless upon examination. In the New York Post-Graduate, certificates, signed by the president and secretary, stating the exact instruction received, are given, but are not signed by the professors.

Dr. CHARLES P. GRAYSON (Philadelphia) confined his remarks chiefly to the teaching of laryngology in under-graduate schools. "*Poeta nascitur, non fit*" applies even more to the specialist than to the poet. He doubted the advisability of devoting more time to special work in laryngology in under-graduate institutions. The student receives instruction in this branch in his third year, during which time he is not only given a knowledge of the more common diseases of this region, but is made to realise the unavoidable limitations of the general practitioner—in other words, to know when his own ability ceases, and when he should seek the assistance of the specialist. A good deal of danger results from teaching these young men enough to make them think they are specialists. He particularly warned his students against undertaking certain cases which the short period of instruction cannot fit them for treating. In an elective course the teacher should do some of the electing. He agreed with Dr. Dench that it is a waste of time on the part of the instructor as well as the student to try to teach those who have neither fitness nor liking for the work. In the first hour's instruction the teacher can discover whether a student has or has not any talent for special work. Some men can never learn to handle instruments skilfully, whereas others have a light and delicate touch from the beginning. It is useless to waste time with the former class. Without adding to the time already allowed in the curriculum, students could be taught didactically in the third year sufficient to make them safe if not accurate diagnosticians, and in the fourth year they could be given all the clinical work which is necessary. Operative work should be confined to post-graduate institutions. In conclusion, Dr. Grayson thought it much wiser to endeavour to discover

and develop natural ability than to give exhaustive information which, failing of complete digestion, might often be misapplied.

Dr. HENRY O. REIK (Baltimore) confined his remarks to the teaching of otology in under-graduate schools. He agreed with the views expressed by Dr. Grayson, and had expressed himself in similar terms in the preface to his "Manual" for students of otology. No more time than now given should be spent in the instruction of these students, but more should be accomplished in the time already allotted. All that the public demands or expects them to know is the essentials, the things which, as general practitioners, they should be prepared to meet. They should be equipped with that knowledge which best enables them to recognise diseases and to know when to call upon the specialist. If a student desires to become, or is fitted for becoming a specialist, he should be given the practical points first, and then have these demonstrated clinically as far as possible. The speaker had eliminated descriptions of operations from his course, teaching the recognition of the symptoms of the various diseases. Operations at Johns Hopkins Hospital are open to the students, who are invited to attend them, but this is in no sense a compulsory part of the course. A very distinct line should be drawn between the work of the practitioner and the specialist. Doctors should be given a more comprehensive knowledge in the short time allotted to the specialties.

Dr. MAX A. GOLDSTEIN (St. Louis) said it is evident that there is a wide difference of opinion as to how under-graduate students should be taught. He wished to emphasise very strongly the moral obligation of every teacher of oto-laryngology to give to his pupil just as much as possible of the subject-matter comprising the given specialty. The student, after three or four years in college, goes out to practice, and he will do tonsil and adenoid operations, treat acute and chronic otitis media, etc., and he will not send these cases to the specialist. He will send the more extensive and difficult operations, such as the mastoid, to the specialist, but the others he will undertake himself. The moral responsibility, therefore, rests upon oto-laryngologists as teachers to train the student in the diagnostic, therapeutic, and operative work, which is a part of his general practice. Dr. Goldstein allows his senior students to operate, under direct supervision, upon tonsils and adenoids, to incise drum membranes, etc., thus making them more definitely familiar with the instruments and more confident in themselves. He did not see why there should be an embargo placed upon operations which it is necessary for the under-graduate to perform as soon as he gets out in practice. If a man goes to a post-graduate school without knowing how the drum membrane looks, it is the fault of the teachers in the under-graduate school.

Dr. J. A. STUCKY (Lexington, Ky.) said that what they wanted, and what the average doctor wants, is to know how to advise the patient what to do. The speaker was not convinced that the average man who takes a post graduate course does so with the idea of developing into a specialist. If so, this idea should be discouraged, but the diagnostic part of the eye, ear, nose and throat, work should be emphasised. He had seen several men holding post-graduate certificates attempt to remove turbinates, with serious results. Certificates which grant the legal right to practise a specialty should not be carelessly granted.

(To be continued.)

Abstracts.

NOSE.

Schaeffer, Jacob P.—The Lateral Wall of the Cavum Nasi in Man, with Special Reference to the various Developmental Stages. "Annals of Otology, Rhinology, and Laryngology," vol. xx, p. 277.

A long and comprehensive paper of eighty-nine pages, illustrated by fifty figures. It leads up to a summary under forty heads. It is a contribution to rhinological anatomy and embryology that requires reading with the closest attention, and no attempt at abstracting could be successful.

Macleod Yearsley.

Kolmer and Weston (Philadelphia).—Bacterin Treatment of Septic Rhinitis of Scarlet Fever with Report of 100 Cases. "Amer. Journ. Med. Sci.," September, 1911.

The report of the Metropolitan Asylums Board of London on "return cases" showed that in 52 per cent. of these there was present a morbid condition of the nose; and this percentage agrees closely with that obtained by the writers from the records of the Philadelphia Hospital for Contagious Diseases. The nasal disease in these cases takes the form of a purulent or non-purulent rhinitis, which was found in a great majority of cases (89 per cent.) to be due to the *Staphylococcus aureus* in pure culture. The only other organisms discovered were the *Staphylococcus albus*, a diphtheria-like bacillus, and the *Streptococcus pyogenes*. Vaccine treatment was undertaken with the object of overcoming this septic infection and not with the idea of combating the causal agent of scarlet fever itself, it being supposed that this scarlet fever agent, whatever it might be, would die if the superadded septic infection were removed. Although many of these cases of rhinitis heal promptly with the usual treatment, the authors found that the time required for such a result was very much decreased with the bacterin treatment. The latter was valueless when adenoids were present. As good results were obtained with stock polyvalent vaccines as with autogenous. The writers conclude that: (1) Nasal discharges are of primary importance in the aetiology of the "return cases" of scarlet fever. (2) The true rhinitis of scarlet fever is septic in character, distinctly infectious in itself, and probably harbours the contagium of scarlet fever. (3) The bacterin treatment of these cases is more satisfactory than the usual treatment. It shortens the time required for cure, and decidedly aids in decreasing the number of "return cases."

Thomas Guthrie.

Lowe, Ludwig.—Some Further Contributions on Nasal Surgery. "Monats. f. Ohren.," Year 45, No. 9.

(a) *Exposure of the Hypophysis Cerebri*.—The author first refers to the two methods of approaching this structure as described by him some five years ago, the first by means of removal of the outer wall of the nose, and the second through a supra-hyoid pharygotomy—and then passes on to the detail of a "far more easy" procedure carried out *via* the mouth. By means of a median incision and two small ones extended thence to each side, the muco-periosteum of the hard palate is reflected up to the alveolar margin and then the horizontal portions of both maxillary bones together with their palatal processes are removed with hammer and chisel, so that thus the under surface of the mucous membrane of the nasal floor with the vomer in the middle line is exposed.

Next the mucous covering of the nasal septum is stripped off each side, still working in the same direction, and the bony septum itself eventually resected, bringing the anterior and inferior aspects of the body of the sphenoid bone into full view, which structure then can be easily removed and the roof of the sphenoidal sinuses dealt with as required. The whole operation, says the author, is no more than a submucous nasal resection, except that the approach is *via* the mouth, and theoretically could be performed under cocaine and adrenalin, but that it is irksome for the patient to hold the mouth open so long, and with a general anæsthetic it can be opened further. Löwe acknowledges that this procedure is based on the methods of Gussenbauer, König and Hirsch. The buccal wound is subsequently closed with sutures.

(b) *Exposure of the Naso-pharynx.* A short allusion to other methods having been given the author describes his procedure as follows: A transverse incision is made dividing the soft from the hard palate. This in itself may be found sufficient, but if more room is still required an incision is carried though the mucous and periosteal covering of the hard palate on each side, a rectangular flap thus elevated from behind forwards, and the underlying bone removed so that the mucous membrane of the nasal floor is exposed. This latter is then divided as may be necessary and the naso-pharynx thus reached. The bone removed is in a short time reformed.

A section devoted to the topographical anatomy of the pharynx concludes the article.

Alfred R. Tweedie.

Baril, G.—Anatomical Study on Regional Anæsthesia of the Superior Maxillary Nerve. "Rev. Hebdom. de Laryngol., d'Otol., et de Rhinol." September 2, 1911.

Dr. Baril is of opinion that for operations on the maxillary antrum satisfactory regional anæsthesia may be obtained by the injection of a weak anæsthetic solution *via* the posterior palatine canal into the region of Meckel's ganglion and the superior maxillary nerve in the pterygo-maxillary fossa. The buccal orifice of this canal is situated at the base of the third molar tooth. Its line of direction continued forward crosses the neck of the second molar tooth, continued backward it passes through the foramen rotundum at a distance of four and a half centimetres from the neck of the second molar tooth. The technique suggested is as follows: The mouth is opened wide. A platinum needle, not more than five centimetres in length, is introduced into the gum on the inner side of the neck of the second molar tooth. The body of the syringe rests on the lower lip. The needle is pushed on for about one centimetre till its point is opposite the base of the third molar tooth. It now engages the mouth of the posterior palatine canal, along which it is carried for a distance of four and a half centimetres from the point of insertion.

Dr. Baril has carried out this procedure frequently on the cadaver, and considers that it would be of practical use. He has tried the method in one case (radical cure), and was successful in obtaining satisfactory anæsthesia.

John M. Darling.

PHARYNX.

Fraser, J. S.—The Faucial Tonsils, with Special Reference to their Removal by Enucleation. "Edin. Med. Journ.," July, 1911.

In this paper the author gives a clear account, made all the clearer by some excellent illustrations, of the anatomy of the tonsil and its relations

to adjacent structures, briefly discusses the physiology and the common affections of the tonsil, the indications and contra-indications for operation, and the various operations that are or have been employed. He then gives a full and very lucid description of the operation of enucleation of the tonsil. In adults he prefers operating under local anæsthesia, first spraying the throat with 10 per cent. solution of cocaine, then injecting a very weak solution of cocaine, to which a few drops of adrenalin have been added. The important point in making this injection is to get the solution under the mucous membrane only, but not into the tonsil tissue. If a general anæsthetic has to be used he prefers chloroform, and has the patient's head hanging over the end of the table. If the patient begins to "come to" the operation is stopped, the patient turned almost face downward, and the anæsthetic again administered. (This seems to be a very clumsy procedure. If a tongue-depressor, with a tube for the purpose along its upper surface, is attached to a Junker's inhaler and the chloroform administered through it, the operation need very rarely be interrupted to get the patient under again, and an assistant can be dispensed with also). In 120 cases of enucleation Fraser has had no post-operative sepsis, and only two cases of moderately severe hæmorrhage, both of which were controlled by local pressure with a sponge wrung out of turpentine.

Arthur J. Hutchison.

Levinstein, O. (Berlin).—On the Treatment of Chronic Tonsillitis and Habitual Angina, with especial Reference to the use of the Galvano-cautery. "Archiv. f. Laryngol.," vol. xxiv, Part II.

A discussion of the physiological function of the tonsils and of the rôle played by them in the causation of a large variety of diseases, including pulmonary tuberculosis, appendicitis and nephritis, leads the writer to the conclusion that so long as it has not been proved that the tonsils are without value to the organism the ideal treatment for chronic tonsillitis must be that which brings about permanent cure with the least possible injury to the organ. In mouth-breathers the tonsils are especially exposed to infection by micro-organisms, so that something may be done in these cases by establishing free nasal respiration. Another important measure, and one which is in some cases alone sufficient to put an end to the trouble, is division of the plica triangularis. Of the numerous methods employed for dealing especially with tonsils which, though not enlarged, are diseased and subject to repeated inflammatory attacks, the writer prefers obliteration of the diseased crypts by means of the galvano-cautery point. In carrying out this treatment his aim is to destroy only those crypts in which the presence of a plug indicates a condition of chronic inflammation. In a considerable number of cases, which suffered from almost regularly repeated attacks of acute follicular tonsillitis, he was able to bring about a cure by treatment at one sitting; in some several repetitions were required; in no case had the method failed.

Thomas Guthrie.

Prowse, S. W.—Fatal Case of Quinsy in an Adult. "Laryngoscope," February, 1911, p. 105.

The case described was a male, aged thirty-eight. His throat had been sore for four days, and he then took a fourteen-hour train journey to his home, but died while leaving the station in a cab. At the *post-mortem* a large double quinsy was found with edema of the glottis, which had given rise to asphyxia. Neither abscess had burst.

John Wright.

Cline, L. C., M.D.—A Case of Sarcoma of the Tonsil in a young Child. "Laryngoscope," March, 1911, p. 153.

The patient was a boy, aged twenty-two months. Two months previously he had an abscess of the left tonsil, which ruptured spontaneously. The child now suffered from dyspnoea on lying down and presented a soft, nodular, friable growth from the left tonsil filling the pharynx. The glands at the angle of the jaw were enlarged. A section showed the typical structure of lympho-sarcoma. Urgent dyspnoea was relieved with but slight hæmorrhage by local removal, death occurring two weeks later.

John Wright.

Richardson, M. H.—Remarks on a Forbidding Case of Cancer, involving Tongue, Tonsil and Pharynx, permanently Cured by Radical Excision. "Boston Med. and Surg. Journ.," June 29, 1911, p. 920.

Man, aged sixty-one. The whole growth, together with a chain of glands from the angle of the jaw to the sterno-clavicular joint, was removed through a curved incision, convex downwards, from the mastoid process to the symphysis of the jaw, a second incision passing down from the centre of the first nearly to the sternum. The operation was performed December 12, 1905, and pathological examination showed it to be epithelioma. Patient still alive and healthy, examination on February 11, 1911, showing no recurrence.

Macleod Yearsley.

Love, A.—Diphtheritic Paralysis. "Glasgow Medical Journal," October, 1911.

Paralysis following diphtheria has become rare since the use of antitoxin has become general. Taking eighty-five cases of diphtheritic paralysis it is interesting to note that sixty-five recovered and twenty died. Out of eighty-five cases eight had also nasal implication, seven a combination of faucial and laryngeal paralysis, and in three cases tracheotomy had to be performed; twenty-seven had enlarged cervical glands, in two instances with suppuration. It is interesting also to note that out of these eighty-five cases, fifty-three had paralysis of the palate alone, fifteen of the eyes and palate, three of the eyes alone, twelve of the intercostal muscle and cardiac muscles, one of the lower limbs, and one general. Albuminuria was present in sixty-two cases; in twenty-seven of these there was a large quantity and in others only a trace, but this trace could be detected for many weeks. Thirty-eight out of the eighty-five cases when treated with antitoxin had urticarial rashes. If antitoxin has been injected early in the disease it does not relieve or cure the paralysis by re-administration; the best treatment is to feed the patient and keep up the general physique as far as possible.

Andrew Wylie.

McKeen, S. F.—Sudden Death following a Prophylactic Dose of Diphtheria Antitoxin. Autopsy Reveals Status Lymphaticus. "Boston Med. and Surg. Journ.," April 6, 1911, p. 503.

A girl, aged seventeen, was given 500 units and died fifteen minutes later, becoming unconscious, cyanotic and pulseless. The thymus weighed 25 grm., and there were numerous enlarged mesenteric lymph nodes, swollen Peyer's patches, enlarged spleen and small adenoids.

Macleod Yearsley.

Frese, Prof. (Halle a. S.)—A Unique Disease of the Buccal and Pharyngeal Mucous Membrane. "Zeitschr. f. Laryngol., Rhinol., etc.," Bd. iii, Heft 5.

It is only in the early stages that different diseases of the mouth are

characteristic; later on all superficial conditions tend to ulcerate on account of the heat, moisture and friction which are present. So many micro-organisms are present in the mouth that it is difficult to be sure that you have isolated the real causal factor. The oral disease may only be part of a general process and may be observed by a laryngologist, a dermatologist or a physician; for these reasons classification of buccal diseases has hitherto been clinical rather than pathological. All the cases described by Frese came from a single small village. Case 1: Female, aged nineteen, had had small ulcers in mouth and pharynx at intervals since age of seven. The patient's mother had the same trouble; lips and cheek especially affected; each attack lasted three or four weeks. The general health was not affected, and the attacks had no relation to menstruation or to the seasons of the year; never any skin-eruption. Of late the ulcers had shown a tendency to persist, and one had been present on the left tonsil for three months. The trouble began as small red spots, which on account of central necrosis soon became ulcers; no vesicular stage ever observed. The patient complained of pain during chewing and swallowing, and of late had lost weight. The ulcer on the lip had a sharp border and a yellowish-grey surface layer which could only be removed with a sharp spoon; the cheek, tongue and tonsil showed similar ulcers; the edges of the ulcers were red and slightly infiltrated. Teeth and gums appeared to be in good condition, but the tongue was furred and indented; the inner surface of the cheeks showed the scars of old ulcers. Faecal absent and cervical glands not enlarged. Eight days later some of the ulcers had healed and others had increased in size; one new one had appeared. Three months later the patient complained of pain on swallowing—the pain shot up to the ear—and on laryngoscopy an ulcer was observed in one pyriform sinus. Frese treated the case by the application of tincture of iodine and anaesthesia. Microscopic examination of the tissue showed nothing characteristic—complete loss of epithelium and fibrinous masses and leucocytes with only a few cocci; no fusiform bacilli, spirilla or tubercle bacilli. Wassermann's reaction negative. No cause could be found for the condition in the milk or water supply, though several other people in the village had the complaint.

Frese does not regard the cases as aphthous stomatitis because of the scars left when the ulcers healed. He also rejects herpetic stomatitis because in this there is always a formation of blebs; further, such eruptions occur in groups and do not leave a scar. Pemphigus, erythema exudativum multiforme, sporotrichosis, syphilis and tubercle are all excluded by the author, who names the condition "stomato-pharyngitis ulcerosa disseminata."

J. S. Fraser.

Smyth, H. E.—Accessory Thyroid Tumours of the Tongue. "Annals of Otology, Rhinology, and Laryngology," vol. xx, p. 367.

The author describes three cases, and gives brief particulars of forty-five occurring under the care of others. He concludes that accessory thyroid tumours of the tongue are more common than has been generally supposed, that they result from Nature's effort to supply a physiological need, that they frequently require no treatment, and should be considered simply as a misplaced thyroid gland, and that care should be taken to ascertain the presence of some other source of thyroid secretion before removing them radically.

Macleod Yearsley.

LARYNX.

Tratman, Frank—**A Case of Fibroma of the Larynx.** "Australasian Medical Gazette," August 21, 1911.

A man, aged fifty-four, suffered from hoarseness with dry cough. The whole of right vocal cord was red, and had on its middle a swelling as large as a pea, sessile and not ulcerated. The whole of the right cord with the growth and the contiguous part of the thyroid cartilage to which it was adherent was removed by thyrotomy. Tracheotomy tube removed at once and wound sewn up in whole length. A section showed the growth to be a pure fibroma. Patient left the hospital in eight days. [As "malignancy was not suspected," one wonders why so radical an operation was considered necessary.—Ref.]. *A. J. Brady.*

Oppikofer, E. (Basle).—**Necrotic Inflammation of the Larynx, Trachea, and Œsophagus in Scarlet Fever.** "Archiv für Laryngol.," vol. xxv, Part 2.

A downward extension of the necrotic process in severe scarlatinal angina has been hitherto regarded as very exceptional, and many of the text-books refer to this complication either very briefly or not at all. The author found among the records of 128 *post-mortem* examinations in scarlet fever cases, carried out at the Pathological Institute at Basle between the years 1874 and 1911, 92 instances of inflammation in the larynx, trachea or Œsophagus; and in 66 of these the process was definitely necrotic. A short description is given of the condition found in each of the 66 cases, from which it appears that the laryngo-tracheal and Œsophageal disease is probably always secondary to, and a downward extension of, a severe scarlatinal angina. The parts about the entrance to the larynx were most often attacked, but extension to the interior of the larynx was not infrequent; in 14 cases the trachea and in 3 the bronchi were also involved. Ulceration was found in the Œsophagus in 15 cases, in all except 3 of which the larynx was also affected. Of the 66 patients 37 were males and 29 females, and the ages varied between a half and twenty-five years. Severe necrotic inflammation of the larynx and Œsophagus was much more frequent in the earlier than in the later years of childhood, but even adults were not completely exempt. The author believes that in spite of the great rapidity with which destruction of tissue takes place in scarlet fever an early and rational local treatment may be of value in such cases in limiting the necrotic inflammation to its primary seat in the pharynx. The paper includes a detailed review of the literature. *Thomas Guthrie.*

EAR.

Weil, Arthur J.—**Acute Otitis in Measles, Diphtheria and Scarlet Fever.** "New Orleans Med. and Surg. Journ.," vol. iv, p. 210.

The author discusses frequency, and gives the origin of acute otitis thus: Scarlet fever—(1) Toxins of the disease; (2) extension from the throat; (3) general weakness and emaciation. Diphtheria affecting—(1) External auditory canal; (2) internal ear, analogous to post-diphtheritic paralysis of the soft palate, etc.; (3) Eustachian tube and middle ear; (4) middle ear similarly to the affections caused by scarlet fever or measles. Etiology, prophylaxis, diagnosis, bacteriology, treatment and prognosis are separately dealt with in a useful paper. *Macleod Yeasley.*

Grazzi V. (Florence).—The Organ of Hearing in Connection with Railway Management. Congress of Medical Officers of Italian Railways, Florence, 1910.

Prof. Grazzi, in his remarks, prefixed a few considerations on the fact, not very easily to be comprehended, that the organ of hearing, one of the most important of all the senses, and one which plays so great a part in regulating the movements of railways, should have been, at any rate in Italy, completely neglected up to the present time, while in some nations among various railway companies the institution of official aurists has been in existence for many years past. Dr. Grazzi then briefly recorded the history of the establishment of a medical service for the care of the ear in connection with the railway. He explained the damage which is suffered, both by travellers and by employes, closely related with the working of trains, through the transgression of certain rules of hygiene concerning the principal respiratory passages and the organs of hearing themselves.

As a remedy for such great inconveniences he advised the diffusion of otological knowledge among medical men and the public. For the first of these it would be necessary to render the teaching of otology obligatory in all the universities, whereas at present in Italy there are few colleges set apart for this most important branch of general medicine. To obtain the second he recommends the diffusion of elementary facts concerning the hygiene of the ear and of the principal respiratory passages by means of practical manuals to be distributed gratis among the employes of the railways, and of suitable advice printed on sheets to be affixed in the waiting-rooms of the stations for the instruction of travellers.

Finally, to obviate the various dangers which the organ of hearing undergoes, not only in those who are immediately connected with the working of trains but also in those who travel, Dr. Grazzi believes it would be of great use and of immediate effect to lower, as far as is possible, the tonality of various acoustic signals actually in use upon the railways. By lowering, with due precautions (suggested by physical and suitable experiments), the acuteness of whistles, bells, sirens, etc., as is done in many steamers, their efficiency would not be diminished and the acoustic organs of the employes and of travellers themselves would be spared immeasurable damage. W.

Holmes, E. M.—A Case of Vertigo cured by Treatment of the Eustachian Tube. "Boston Med. and Surg. Journ.," June 15, 1911, p. 848.

A woman, aged fifty-two. Symptoms followed a cold in March, 1910. Deafness, low rumbling tinnitus, and increasing vertigo. Both membranes retracted and thickened. Treated by regular catheterisation from September 8, 1910, to January 5, 1911, without improvement. Tests gave middle-ear reactions. The naso-pharyngoscope showed the right Eustachian tube moderately swollen and injected, the left tube much swollen and its movements restricted, the posterior boundary of the left Rosenmüller's fossa in contact with the Eustachian cushion, but no adhesions. Applications of argyrol (15-20 per cent.) were made every other day, reducing the swelling, curing the vertigo, and causing the membrane to lose its markedly retracted appearance. Treatment was continued to March 16, 1911 (commenced January 5). The case is carefully reported, and is important as showing the great value of the naso-pharyngoscope.

MacLeod Yearsley.

Dortu, P. (Liège).—Abscess of the Cerebellum, and Chronic Suppuration of the Labyrinth Complicating Chronic Otitis Media. "Rev. Hebdomadaire de Laryngol., d'Otol., et de Rhinol.," February 11, 1911.

The case recorded occurred before the method of testing the labyrinth was understood. The patient, a boy, aged eleven, had a severe rigor, followed by pains in and around the left ear, and discharge. Four days later another rigor occurred, this time followed by vertigo, nausea, and repeated vomiting as well as increased pain.

On admission to the hospital, eight days after the onset, the boy was seriously ill. The head was strongly bent towards the left shoulder by a painful torticollis. In the left auditory meatus was a small quantity of fetid pus, and a large granulation springing from a perforation in the attic. There was left facial paralysis. The gait was uncertain and staggering, with a tendency to deviate away from the side of the lesion. There was intense vertigo and nausea. Romberg's sign was pronounced. The pulse 100 and the temperature 98.7 F. Examined by lumbar puncture the cerebro-spinal fluid was normal.

A radical mastoid operation, performed the next day, gave great relief, but two days later severe occipital pain came on, with drowsiness and asthenia. The pulse fell to 54. The left arm and leg became paretic, with exaggeration of the patellar reflex. There was mydriasis and commencing papillitis. The cerebellum was explored, but no pus was found. The following day the patient suddenly became comatose and died.

At the autopsy a fistula was found in the left external semicircular canal, the whole of the left labyrinth was suppurating, and there was an abscess in the left lobe of the cerebellum. *Chichele Nourse.*

Pommerehne, F. (Brunswick).—Abscess of the Left Temporal Lobe with Sensory Aphasia, etc. "Arch. f. Ohrenheilk.," Bd. lxxxii, Heft 1 and 2, p. 25.

The patient was a woman, aged twenty-five, with chronic suppuration in both ears. General malaise, apathy, somnolence and inability to answer questions were noted, and severe headache radiating from the left ear gave the clue to the side of the brain affected. The interesting feature in the symptom picture exhibited by the case lay in the presence of complete ophthalmoplegia affecting the left eye, together with partial paralysis of the muscles of the right eye. In the title of the article the paralysis is called "oculo-motor," but as the globe was fixed motionless in the median position all the motor nerves of the eyeball must have been involved.—*Abs.* The abscess, a large one, was opened through the roof of the aditus ad antrum. Recovery followed.

The author suggests that the paralysis of the left eye was due to the direct pressure of the abscess on the orbital nerves at the base of the brain, and that the partial paralysis of the right eye was due to pressure upon the nucleus of the third nerve. *Dan McKenzie.*

Bauer, Julius, and Leidler, Rudolf.—The Effect of Removal of Various Parts of the Brain on the Vestibular Eye-Reflex. "Monatsf. Ohren.," Year 45, No. 8.

Stimulated by the already large amount of literature on this subject by various writers, reference to which precedes the article, the authors give the result of their own investigations carried out on seventeen rabbits as follows:

(1) If the vermis be removed the duration and intensity of the nystagmus after rotation is considerably increased.

(2) A lesion limited to one side results in a raised excitability on the homolateral side alone. In bilateral lesions of unequal severity the excitability on either side varies directly with the intensity of the stimulus.

(3) The over-excitability generally disappears in from five to ten days.

(4) Removal, or lesions, of the cortex of the vermis alone do not produce such results.

(5) Removal of one hemisphere alone, that is without a lesion of the vermis and its nuclei or of the fibres of the eighth nerve, does not cause any pathological changes in respect of the vestibular apparatus.

(6) Rotation in cases where such over-excitability had been induced evokes a correspondingly increased intensity of the nystagmus, whilst certain other individual variations may also be observed.

(7) General anæsthetics reduce this excitability, which, however, reappears when the effect of the drug has worn off.

(8) After removal of the small brain, including the vermis and both hemispheres, no spontaneous nystagmus is ever seen.

As regards their experiments on other parts of the brain the authors are able to state that complete removal of the cerebrum including the thalamus and extensive destruction of the mid-brain together with most probably the oculo-motor centres does not prevent the production of vestibular nystagmus.

Alex. R. Tweedie.

MISCELLANEOUS.

Schamberg, J. F.—An Epidemic of Chancres of the Lip from Kissing.

"Journ. Amer. Med. Assoc.," vol. lvii, x.

This paper deals with a most unfortunate epidemic, which teaches all of us a lesson, and draws attention to the dangers of the promiscuous kissing either between those of the opposite or of the same sex. Physicians are reminded of the responsibility resting on them in safeguarding the public from luetic patients under their care. The author thinks that instructions given to patients are too often perfunctory and unimpressive.

A coterie of young men and women varying in age from sixteen to twenty-two years gave a minstrel performance as a benefit. Following this a party, and later a banquet were given, at which juvenile kissing games were indulged in. One of the participants, a young man of twenty-two, had a sore on his lip, the nature of which he avers he did not know. Six young women kissed by him developed chancres of the lip. A young man present at the affair likewise developed a chancre of the lip apparently from the virus deposited on the lips of one of the young women, for he did not come into contact with the original source. In addition, a young woman kissed by the offender at a third social function likewise developed an initial sclerosis, making in all eight labial chancres from the one source. The original offender was examined by the author, and gave the following history: He first noticed a sore on the left side of the lower lip about February 12, 1911. On March 3 he consulted a physician, who did not inform him of the contagious nature of the lesion. The physician, on being interrogated, declared that he advised the young man to take all precautions; there is, therefore, a question of veracity between the patient and his physician. The Wassermann reaction was strongly positive in all cases.

Perry Goldsmith.

REVIEW.

Diseases of the Nose and Throat, comprising Affections of the Trachea and Esophagus. By ST. CLAIR THOMSON, M.D., F.R.C.P., F.R.C.S. Eighteen plates and 294 figures in the text. Pp. xvi + 791. London: Cassell & Co., 1911.

The author of this treatise states that in writing it he has striven to keep two things constantly in mind: one, that it should serve as a guide to senior students, and the other, that it should prove a volume of ready reference for those engaged in the exercise of their profession; and it may be said that the arrangement of the text, the clear concise style of the author's ready pen, the profusion of illustration in colour and black and white, must render this text-book one of very great value to those to whom it has been more particularly addressed.

Professor Thomson is certainly right in his belief that experience gained during some years in general practice tends to save the specialist from taking too narrow and too mechanical a view of the diseases of the air-passages, but such early training has also enabled him to supply such information and assistance as a practitioner is likely to require. Indeed, it is given to few so to combine the authority of a master with the invaluable experience of general practice.

The work is divided into eleven sections, Part I dealing with embryology and physiology, methods of examination and general symptoms, and containing a chapter on general treatment, and one on special conditions and dangers of operations. The introductory pages on embryology are short, clear, and to the point, attention being directed merely to those embryological data that are essential to the understanding of the various congenital defects that one encounters in practice; and the author's concise pages on the defensive arrangements of the upper air-tract will be most valuable to students. The chapter on methods of examination, which include directions for direct laryngoscopy, bronchoscopy, and esophagoscopy, is all the beginner can desire, and the same may be said of the excellent chapter "on treatment," in which is comprised directions for preventing cocaine poisoning, and for dealing with such poisoning when it occurs.

Part 2, diseases of the nose, opens with chapters on the symptoms of nasal disease and on "taking cold," epistaxis, and injury to the nose. All are good, but as the next chapter begins with acute rhinitis, it is difficult to see the advantage of separating "taking cold" from its natural place under acute rhinitis, and it will not be easy for the student to pick out the possible sequelæ of chronic rhinitis when he is invited to turn back to the "symptoms of nasal disease" for his information. The various views as to the ætiology of atrophic rhinitis are sufficiently examined, compared, and considered, but the same can hardly be said of causes of nasal polypus. As fibrinous rhinitis associated with diphtheria organisms has been proved to have caused diphtheria in contacts, the author is making a mistake when he relies on the investigations of Lack on fibrinous rhinitis, and concludes that fibrinous rhinitis, despite the presence of Klebs-Loeffler bacilli, *never* causes diphtheria in others, and therefore does not require notification or strict isolation.

Again, we observe that the description of the operative technique of submucous resection of the septum is excellent and full, but no one could do justice to Hajek, Gleason, and Watson's operations from the very short note on these septal operations, amounting to less than six lines in all. Dr. Thomson appears to commend Lack's practice of removal of both

middle turbinals, and even of all four turbinals, "in very aggravated cases of hay-fever," but, as a matter of fact, Lack reserved what he termed "this severe measure" only for "the worst cases when all other treatment fails."

Part 3 on diseases of the accessory sinuses including their surgical anatomy occupies seventy-eight pages, and is enriched with forty-five illustrations. A good suggestion on transillumination of the antrum is to depress the lower eyelid, as the sclerotic is then lit up and the eyeball becomes translucent around the iris if the antrum is clear. The description of the intra-nasal and canine fossa radical operations for empyema are very clear, but the author does not mention any method which avoids resecting the anterior third of the inferior turbinal, and we may point out that if a trephine opening is made in the canine fossa it saves all the trouble of using burrs or bone forceps to keep "the margin of the orifice as smooth as possible." The description of Killian's radical operation for frontal sinus suppuration leaves nothing to be desired; it is not easy to convey so clearly a conception of the operation from start to finish, and this is the best account of Killian's method we have read in the English language, while the author's own results are certainly a matter for congratulation. We feel, however, that some of the other operative methods for frontal sinus suppuration might have been noted besides those of Ogston and Kuhnt; and even if not approved some reference to the intra-nasal operation, *e. g.* that of Max Halle, might reasonably be expected in a comprehensive text-book; while the technique of the sphenoidal sinus operations is too scantily discussed, and is hardly in keeping with the generally complete character of the author's work.

Part 4 on diseases of the naso-pharynx and Part 5 on diseases of the pharynx and tonsils are well treated, while Section 6 on diseases of the larynx is excellent throughout. An ingenious suggestion is made in cases requiring complete laryngectomy, viz. the maintenance of a fistulous communication between the neck-wound and the naso-pharynx. In one case the author did this, and into the fistulous opening a Braun's artificial larynx was inserted, so that the patient can now breathe through the nose and talk in a loud whisper, and even ride a bicycle two and a half years after the operation. We are glad to see that the author has been enabled to present a series of coloured illustrations of malignant disease of the larynx and of conditions simulating laryngeal cancer by Sir Felix Semon; they are excellent and highly instructive.

Part 7, diseases of the trachea and œsophagus, is a short section, but one that will be much appreciated. Part 8 is on chronic infective diseases of the upper air-passages, viz. lupus, tuberculosis, syphilis, glanders, leprosy, scleroma, and actinomycosis. Laryngeal tuberculosis is exceedingly well discussed, but we should have expected due reference to the researches of Jobson Horne on laryngeal tuberculosis. Acute specific fevers in the nose and throat are the subject-matter of Part 9, and gout, rheumatism, myxedema, acromegaly, angio-neurotic œdema, herpes, pemphigus, exudative pemphigus of the next short section. Foreign bodies and the chief capital operations of rhino-laryngology occupy the remaining sections, a list of useful formulæ concluding the work.

This excellent treatise cannot fail to redound to the credit of British laryngology and to the publishers; it is a complete, authoritative, and scholarly picture of modern rhino-laryngology, beautifully illustrated, and well arranged; while it is short enough to be read by senior students, it is also long enough to be of real service in practice, and is, we may add, cheap at the price.

P. Watson-Williams.

INDEX TO VOLUME XXVI, 1911.

SUBJECTS.

	PAGE
Abductor paralysis, <i>see</i> Cords, vocal.	
Acoustic nerve, <i>see</i> Auditory nerve.	
Adductor paralysis, <i>see</i> Cords, vocal.	
Adenoids (J. Symington)	51
——— anæsthesia for removal of (F. Guyot, Lautmann, Rupprecht)	614, 382, 544
——— and the hypophysis (Citelli)	544
——— in school children (Macleod Yearsley)	51
——— intra-nasal extension of (A. Meyer)	437
——— operation for complications of (S. M. Bourack, Grossard and Kaufmann)	495-544, 614, 383
——— respiratory re-education of (Labouré)	614
——— with albuminuria, etc. (J. M. O'Meara)	613
Alæ nasi, collapse of, ætiology and operative cure of (M. Halle)	348
Alcohol intoxication, experimental (R. Bárány)	652
American Laryngological, Rhinological, and Otological Society	101, 151, 271, 317, 653
——— ——— President's Address (Logan)	101
——— ——— Rhinological and Otological Society	476, 536
Anæsthesia, nasal reflex during (J. Blumfeld)	493
Antrostomy, nasal, burr for (S. Hastings)	217
Antrum, maxillary, anatomy of (J. P. Schaeffer)	327
——— ——— dentigerous cysts of (N. H. Pierce)	272
——— ——— disease of, unusual (J. P. Clark)	50
——— ——— empyema of, <i>see</i> Suppuration of.	
——— ——— local anæsthesia of (G. Baril)	663
——— ——— operation on, blocking of nasal duct (D. McKenzie)	215
——— ——— osteoma of (Phillip)	483
——— ——— radical operation on (W. L. Ballenger)	153
——— ——— simple growths of (Kahler)	489
——— ——— sarcoma of (H. J. Davis, O. Freer)	34, 440
——— ——— suppuration of, followed by sarcoma (H. J. Davis)	34
——— ——— suppuration of, in childhood (H. J. Davis)	35
——— ——— tooth in (H. Tilley)	213
Aphonia (F. F. Muecke, L. W. Pegler)	217, 308
——— in a boy (W. J. Horne)	217
——— recurrent (G. Cathcart)	142
Arseno-benzol, <i>see</i> Salvarsan.	
Arytænoid abscess, primary (Curtis)	329
Asthma, endoscopic treatment of (W. Freudenthal)	537
——— nasal (Grossmann, Jay)	269, 493
——— (P. Watson Williams)	617
Auditory nerve, action of salvarsan upon (O. Beck, Benario, Desneux and Dujardin, Gander and Guggenheim)	317, 608, 499, 500, 501
——— ——— acute posterior poliomyelitis affecting (J. R. Hunt)	165
——— ——— and multiple sclerosis (O. Beck)	219
——— ——— angio-neuritic paralysis of (M. Farquharson)	17
——— ——— tumour involving (Urbantschitsch)	609

	PAGE
Austrian Otological Society	154, 312, 608, 659
Autokinesis interna and externa (von Stein)	445
Brain, complication of frontal sinusitis (J. S. Fraser, J. D. Lithgow)	45
—— exposure of, through nasal sinuses, etc. (Onódi)	435
—— topography of (Onódi)	435
—— <i>see also</i> Frontal lobe, Temporo-sphenoidal lobe, etc.	
British Medical Association, Birmingham Meeting, July, 1911	561, 599, 626 <i>et seq.</i>
Bronchiectasis due to foreign body, removal (H. Tilley)	211
Bronchoscopy (P. Watson-Williams and A. J. M. Wright)	525
—— for foreign bodies (H. Tilley, D. C. Green, Casselberry)	211, 276, 319, 525
—— treatment of asthma by (W. Freudenthal)	537
Bronchus, foreign body removed from (H. Tilley)	211
Caloric tests of posterior canal (Cheatle and Jenkins)	92
Canals, semicircular, external, fistula of (Bondy, W. Milligan, L. Sewell)	154, 90, 54
—— ——— posterior, exposed (Cheatle and Jenkins)	92
—— ——— superior, fistula of (S. Scott)	201
Cancer, disappearance of, case of (R. H. Woods)	495
Carotid artery, internal, rupture of (F. Nuernberg)	554
Cerebellum, abscess of (Bárány, J. S. Barr, Ruttin, W. Milligan)	313, 375, 314, 87, 88
—— ——— (P. Dortu)	669
—— ——— secondary to labyrinthitis (J. S. Barr, Bárány)	313, 375
—— ——— function of, tests for (Bárány)	444
—— ——— relationship of, with vestibular apparatus (R. Bárány)	393
—— ——— topography of (Bárány)	444
—— ——— trauma of (Bárány)	314
Cerebro-spinal rhinorrhœa (M. Farquharson)	47
Cheek, tumour of, radium (Walters and Finzi)	530
Colon bacillus, infection of throat by (C. B. Faunce)	494
Common colds (Honeij)	492
Cords, vocal, <i>see also</i> Larynx.	
—— ——— abductor paralysis of, bilateral, tracheotomy (W. Downie)	373
—— ——— epithelioma of (C. W. Richardson)	320
—— ——— nodes of (T. S. Flatau)	553
—— ——— ——— treatment by cauterly (E. A. Peters, C. J. Koenig)	41, 330
—— ——— nystagmus of (W. G. Porter)	44
—— ——— paralysis of, recurrent (Broeckhaert, Levinstein)	496, 547
—— ——— ——— in mitral stenosis (Fetterolf and Norris)	552
—— ——— pathological anatomy of (F. Blumenfeld)	442
—— ——— tuberculosis of (L. H. Pegler)	137
—— ——— tumour of (J. Donelan)	140
—— ——— ulceration of (E. C. Catheart)	85
Deaf, education of the (J. Kerr Love)	432
—— ——— Welfare of the, Bureau for Promoting	448
Deaf Child, The (J. Kerr Love) (review)	503
Deafness after epidemic parotitis (L. Sewell)	557
—— ——— after salvarsan (O. Beck)	650
—— ——— diabetic (W. H. Merrill)	616
—— ——— for conversation, peculiar vestibular reaction (Neumann)	159
—— ——— from cicatricial occlusion of Eustachian tubes (D. R. Paterson)	406
—— ——— from intestinal toxæmia (A. L. Whitehead)	415
—— ——— test for, by noise machine (D. F. Shearer)	553
—— ——— typhoid (P. Manassi)	111
—— ——— unilateral, with vertigo (Dan McKenzie)	95
Dental cysts, pathology of (R. Hoffmann)	550

Diphtheria antitoxin, death following (S. F. McKeen)	PAGE 665
— carriers (A. G. Macdonald)	665
Diphtheritic paralysis (A. Love)	384
	665
Ear and Throat Department, Royal Infirmary, Edinburgh, Reports for year 1909	
Ear, comparative anatomy of (W. J. Horne)	57
— (F. H. Westmacott)	409
— external, congenital tumours of (J. H. Evans)	416
— — erysipelas and abscess of (A. H. Cheate)	53
— — exostosis of meatus (J. G. Connal)	197
— — injuries of (W. Milligan)	126
— — leprosy affecting (G. N. Biggs)	258
— internal, <i>see also</i> Labyrinth.	414
— — injuries of (C. A. Ballance)	
— — suppuration of. <i>See</i> Labyrinthitis, purulent.	260
— — surgery of, <i>see</i> Labyrinthotomy.	
— middle, acute inflammation of (A. J. Weil)	667
— — catarrh of, chronic (M. Yearsley, H. Frey) (discussion)	626, 633, 643
— — — chronic, adhesive processes of (M. Yearsley, H. Frey) (discussion)	626, 633, 643
— — — disease of, prevention (A. Bards)	277
— — — exostosis of (A. Cheate)	93
— — — injuries of (W. Milligan, C. A. Ballance)	258, 260
— — — neoplasm of (W. H. Kelson)	204
— — — suppuration of, and nasal sinus suppuration (Coakley)	328
— — — — capsulated bacteria in (H. B. Graham)	498
— — — — from ozæna (Lamnois and Jacod)	331
— — — — from <i>Streptococcus mucosus</i> (Ruttin)	156
— — — — — meningitis (Ruttin)	156
— — — — Lactic acid for (Stepinski, Haskins)	165, 498
— — — — meningitis: recovery (L. Turner)	49
— — — — ossiculectomy for (H. Tod)	169
— — — — silver nitrate in (G. L. Richards)	53
— — — — vaccine treatment of (Kopetsky)	164
— — — neurosis of (J. R. Page)	390
— — — — from eye-strain (Theobald)	165
— — — symptoms in general diseases (J. J. Kyle)	112
Edinburgh Royal Infirmary, Ear and Throat Department, Reports for the year 1909	57
Ehrlich-Hata Remedy, <i>see</i> Salvarsan.	
Emphysema, subcutaneous, of neck, after removal of tonsils (B. D. Parish)	275
Endoscopy, <i>see</i> Bronchoscopy, etc.	
Epiglottis, epithelioma of (N. Patterson)	143
Ethmoid, bony cyst of (J. A. Thompson)	611
— <i>See also</i> Turbinal, middle.	
— — carcinoma of (J. S. Barr)	376
— — operation on: orbital cellulitis after (A. J. M. Wright)	529
— — — paralysis of third nerve after (A. J. M. Wright)	530
— — — sarcoma of, bilateral (W. Downie)	372
Ethmoiditis, non-suppurative (W. B. Chamberlain)	50
— — visual fields in (G. F. C. Wallis)	252
Eustachian tube, deafness from cicatricial occlusion of (D. R. Paterson)	53
— — — development of (J. E. Frazer)	53
Extra-dural abscess from frontal sinusitis (J. S. Fraser)	45
— — — from primary mastoiditis (Halász)	198
— — — tracking into neck (H. J. Davis)	199
— — — with speech disturbances (Rudloff)	161
Fauces, fibroma of (A. Bronner)	36

	PAGE
Fibrolysin in otology (M. Yearsley)	225
Fistula-symptom (R. Bárány)	312
Foreign bodies, <i>see under</i> Regions.	
French Society of Laryngology, Otology and Rhinology	481
Frontal bone, necrosis of (W. Downie)	374
Frontal lobe of brain, otitic abscess of (P. Watson-Williams)	423
Frontal sinus, <i>see</i> Sinus, frontal.	
Glossitis, chronic (P. Watson-Williams)	529
Halle, University Aural Clinic at	204
Hay-Fever and Paroxysmal Sneezing (Vaso-Motor Rhinitis) (Eugene S. Yonge) (review)	223
Hay-fever, prophylactic inoculation for (L. Noon)	611
Hearing after radical mastoid (C. M. Brown)	447
— effect of tobacco upon (H. O. Reik)	390
— of railway employees (V. Grazzi)	668
— physiology of (G. E. Shambaugh)	387
Hexamethylenamine, elimination of (Barton)	278
Hints for the General Practitioner in Rhinology and Laryngology (Johann Fein) (review)	54
Hungarian Society of Physicians, the Royal; Section—Rhino-Laryngology	432
Hypophysis, <i>see</i> Pituitary body.	
Influenza of nose and throat, recurrent (G. L. Goodale)	105
International Congress of Medicine at Budapest, Laryngological Section	145, 268, 378, 488
— — — — — at London, 1913: Laryngological and	
— — — — — Otological Sections; Officers	487
— — — — — Laryngo-Rhinological Congress, Third, at Berlin	218, 280
— — — — — Otological Congress, Ninth	519
Ionic medication (R. W. MacKenna)	611
JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY, THE	113
Jugular bulb, operations on (G. Tiefenthal)	525
— vein, internal, ligature; rupture of carotid (F. Nuernberg)	554
Labyrinth, <i>see also</i> Ear, internal.	
— — — — — effect of head-injury on (C. A. Ballance, Stenger)	260, 110
— — — — — fistula of (Barany, Bondy, W. Milligan, S. Scott, L. Sewell)	312, 154, 90, 201, 54
— — — — — necrosis of (F. H. Westmacott)	416
— — — — — semicircular canals of, <i>see</i> Canals, semicircular.	
— — — — — suppuration of (Dortu)	669
— — — — — <i>see</i> Labyrinthitis, purulent.	
— — — — — surgery of (Alexander, S. J. Kopetzky)	556, 498
— — — — — syphilis of, in secondary stage (Hintze)	616
— — — — — salvarsan in (O. Beck)	316, 317
Labyrinthine vertigo, treated by operation (G. J. Jenkins)	411
Labyrinthitis, latent (J. Harper)	553
— — — — — pathology of (Max Görke)	398
— — — — — purulent (P. D. Kerrison)	553
— — — — — and cerebellar abscess (J. S. Barr)	375
— — — — — — — — — recovery (Ruttin)	314
— — — — — fatal (J. S. Fraser)	46
— — — — — operation (W. Milligan, L. Bondy)	89, 154
Labyrinthotomy (Bondy, W. Milligan, W. G. Porter)	154, 88, 44
Laryngeal nerve, superior, injection of alcohol into (L. Turner)	48
Laryngitis, chronic (W. Howarth)	304
— — — — — treatment of (T. J. Faulder)	42

	PAGE
Laryngitis, typhoid (M. Pannz)	433
Laryngo-tracheal stenosis, treatment of (discussion) (V. Uehermann, etc.)	145
Laryngology, retrospect of	12
Laryngoscopy, direct (E. F. Ingals)	536
Larynx, <i>see also</i> Cords, vocal.	
— abscess of, primary (Curtis)	329
— cancer of (N. Patterson, L. H. Pegler, C. W. Richardson, P. Watson-Williams)	143, 139, 320, 208, 526
— pathology (F. Blumenfeld, E. Schmiegelow)	442, 52
— in early life (Marschick)	189
— operative treatment of (Koschier)	546
— party-wall of (L. H. Pegler)	214
— radium for (Molinié)	486
— slow evolution of (Moure)	185
— stenosis, complete, from (StClair Thomson)	310
— recurrence in glands, disappearance (R. H. Woods)	195
— thyrotomy (Fournié)	218
— comparative anatomy of (J. G. Wilson)	103, 386
— congenital malformation of (M. Farquharson)	48
— disease of: for diagnosis (A. J. Wright)	78
— epithelioma of, <i>see</i> Larynx, cancer of.	
— fibroma of (F. Trautman)	667
— foreign body in (H. Dencker)	443
— insufflator for (W. J. Horne)	309
— intubation of, conditions ten years after (B. R. Shurly)	386
— and tracheotomy (Citelli)	441
— and fixation of tubes (Bonain)	486
— instruments for (H. P. Mosher)	152
— lupus of (Kelson, J. Safranek)	37, 434
— myasthenia gravis affecting (S. Hastings)	40
— necrotic inflammation of (E. Oppikofer)	667
— neoplasms of (E. Powell)	144
— papilloma of (M. Farquharson, Dan McKenzie)	48, 141
— calcined magnesia for (R. Clauvé)	386
— long-continued (F. R. Packard)	323
— subglottic (W. Downie)	373
— unusual (Carter)	442
— paralysis of recurrent (Broeckhaert, Levinstein)	496, 547
— rigid resistances of (Semmes Spicer)	25
— stenosis of (Uehermann, Thost)	145
— complete, from epithelioma (StClair Thomson)	310
— laryngotomy for (Sieur and Rouvillois)	484
— syphilis of (H. Smith)	321
— salvarsan in (Avellis, Safranek, Gerber)	504, 502
— tuberculosis of (Jouty, L. H. Pegler)	490, 137, 215
— chronic (C. A. Parker)	83
— cure (C. Horsford)	43
— direct laryngoscopy for (Clauvé)	486
— dysphagia, injection of alcohol (Logan Turner)	48
— in a boy (W. J. Horne)	309
— regional anesthesia in (Sieur and Rouvillois)	615
— simulated by foreign body (H. Dencker)	443
— treatment of (Dundas Grant, P. Watson-Williams, G. S. Hett, and discussion)	561, 574, 582, 599
— trichloroacetic acid in (K. Sytschow)	615
— ventricles of, "stripping," in horses (F. Holaday)	205
Lepperts, Dr., retirement of	426
Lehrbuch der Ohrenheilkunde, by Dr. Victor Urbantschitsch, review	56
Leprosy affecting external ear, etc. (G. N. Biggs)	444
— nose (H. J. Davis)	34

	PAGE
Lingual thyroid, <i>see</i> Thyroid gland, lingual.	
Lip, chancres of, epidemic (J. F. Schamberg)	670
Lucae, the late Professor (Dundas Grant)	281
Lumbar drainage in meningeal infection (Wicart)	277
Mackenzie tonsillotome, improved (H. E. Jones)	335
Mastoid bone, cholesteatomatous cavity in (F. H. Westmacott)	416
----- diploëtic infantile: unilateral suppuration (A. H. Cheate)	408
----- operation (C. J. Heath)	517
----- comparison of methods of (J. C. Beck)	277
----- encouragement of healing after (Reik)	332
----- partial (G. Mahn)	1
----- radical, improved hearing after (J. Adam)	377
----- influence upon hearing (C. M. Brown)	447
----- technique of Thiersch graft (Welty)	282
----- wire saw in (V. S. Sein)	123
----- process, <i>see</i> Mastoid bone.	
----- suppuration of, <i>see</i> Mastoiditis.	
Mastoiditis, acute, Bier's method in (G. C. Cathcart)	95
----- clinical and bacteriological study of (L. Turner and F. E. Reynolds)	57
----- in infancy (G. Mathewson)	54
----- intra-cranial complications of (L. Turner and F. E. Reynolds)	57
----- primary (Halász)	498
----- scarlatinal, extensive bone disease from (H. J. Davis)	198
Maxilla, superior, malformation of, unusual (H. Tilley)	137
Mediastinum, tumour of, death by asphyxia (Coakley)	322
"Medical Annual," The, 1910 (review)	55
----- 1911 (review)	332
Membrana tympani, rupture of, in telephone operator (Veis)	163
Ménière's syndrome, treated by operation (G. J. Jenkins)	411
Meningitis from middle-ear suppuration (D. W. Drury)	331
----- recovery (E. Ruthin, Logan Turner)	314, 49
----- remarkable course (Ruttin)	315
----- from mucosus otitis, delayed onset (Ruttin)	156
----- lumbar drainage in (Wicart)	277
Mitral stenosis, recurrent paralysis in (Fetterolf and Norris)	552
Motor ear, influence of, on upper air-passages (D. B. Delavan)	154
Mouth, lupus erythematosus of mucous membrane of (L. Lack)	217
Multiple sclerosis affecting auditory nerve (O. Beck)	219
Mumps, deafness after (L. Sewell)	557
Myasthenia gravis with laryngeal symptoms (S. Hastings, A. B. Kelly)	40, 425
Nasal duct, <i>see</i> Naso-lacrymal duct.	
----- obstruction, <i>see</i> Nose, obstruction of.	
Naso-lacrymal duct, window resection of (West)	328
Naso-pharyngoscope (Holmes, Emerson)	494
Naso-pharynx, cancer of (C. F. Theisen)	317
----- in girl, aged seventeen (T. Guthrie)	449
----- catarrh of, chronic, bacteriology of (C. E. West)	98
----- high frequency for (David)	546
----- epithelioma of (E. Law)	196
----- lympho-sarcoma of (C. F. Theisen)	317
----- polypus of (H. J. Davis, M. Farquharson)	36, 48
----- fibro-mucous (Moure)	482
----- fibrous (W. B. Chamberlain, Walker Downie, W. H. Kelson, W. A. Wells)	540, 372, 84, 539
----- syphilitic obliteration of (Dan McKenzie)	216
Nerves, cranial, action of salvarsan upon (Benario, etc.)	499 <i>et seq.</i>

	PAGE
Nerves, cranial, in tabes dorsalis (W. Williams)	559
<i>See also</i> Vestibular apparatus.	
Neurasthenia, nasal phenomena of (C. P. Grayson)	101
Neuro-recurrence after salvarsan (Benario, Desneux and Dujardin H. Gander)	499 <i>et seq.</i>
<i>See also</i> Vestibular apparatus.	
Nodes, singers', galvano-cautery for (E. A. Peters, C. J. Koenig)	41, 330
Nose and throat, diseases of the (StClair Thomson) (review)	671
cancer of (W. Stuart Low)	50
operative treatment of (Moure)	490
treatment of (J. Price Brown)	325
catarrh of, acute, <i>see</i> Rhinitis.	
circulation of, connection with dura and orbit (G. E. Shambaugh)	105
deformity of, treated by paraffin (W. Downie)	371
by transplanting costal cartilage (W. W. Carter, D. C. Greene)	273, 441
diseases of, injuries of the head and (Ziem)	127
intra-cranial complications of (Freudenthal, Onodi)	379
radium in (T. G. Ouston)	505
relation to tuberculosis (Faracci)	491
to oculo-orbital diseases (Baumgarten, Coffin, Cunningham, Frankenberger, StClair Thomson, Wallis)	160, 272, 338, 439, 531, 242, 511
influence of, on respiration (P. Watson-Williams)	617
irrigation for (Guthberlet)	276
lateral wall of, development of (J. P. Schaeffer)	662
leprosy of (H. J. Davis)	31
leukæmia causing abscesses of (Tunis)	385
lupus of, ionic medication for (R. W. MacKenna)	611
Ronge's operation for (M. Farquharson)	47
myxoma of (Hajek and Polyak)	150
neoplasm of (W. J. Horne)	369
neurasthenic phenomena in (C. P. Grayson)	101
obstruction of, effects (R. Palleine)	549
physiology of (J. Adam)	288
polypus of; choanal (Lång)	492
fibrous (Jacques and Bertemès)	483
from inferior turbinals (J. Adam)	379
malignant transformation of (H. J. Davis)	34
recurrent influenza affecting (G. L. Goodale)	105
reflex of, during anæsthesia (J. Blumfeld)	493
reflex neuroses of (W. S. Bryant)	390
sarcoma of, external operation (W. S. Syme)	429
septum of, deviations of (D. M. Officer)	610
papilloma of (H. Arrowsmith)	440
submucous resection of (Metzenbaum)	440
chisel for (H. Tilley)	31
instrument for (T. H. Pinder)	168
window-resection of (Fein)	491
speculum for, simple (Jas. Donelan)	504
stenosis of, dental treatment of (Brown, Black)	328
synechiæ of, iodo-thiosinamine for (E. Fabri)	440
treatment (Brindel)	481
surgery of (L. Löwe)	662
Nose, syphilis of (Lautmann)	491
salvarsan in (G. N. Biggs, Gerber, Safranek)	414, 502
syringobulbia affecting (A. B. Kelly)	424
Throat and Ear: A Manual of Diseases of (E. B. Gleason) (review)	278
The Diseases of the (W. L. Ballenger) (review)	319
tuberculosis of (W. Hill)	145
chronic (C. A. Parker)	83

	PAGE
Nose, vestibule of, primary chancre of (N. Patterson)	144
— — — — — retention cyst of (Logan Turner)	48
Nystagmus, vestibular, compensatory (E. Ruttin)	609
— — — — — explanation of (L. K. Guggenheim)	388
Ocular symptoms produced by nasal disease (E. Baumgarten, L. A. Coffin, H. H. B. Cunningham, StClair Thomson, O. Frankenberger, G. F. C. Wallis), (discussion)	160, 612, 272, 388, 439, 531, 242, 511, 531
Œsophago-gastroscope (W. Hill)	82, 134, 525
Œsophagoscope with expanding blades (W. Hill)	82
Œsophagoscopy, experiences (S. H. Large),	330
Œsophagus, cancer of (W. Hill, C. Watson-Williams)	307, 143
— — — — — radium in (C. Watson-Williams, C. Hope and N. S. Finzi)	525
— — — — — temporary cure (W. Hill)	43
— — — — — diverticula of (E. Mayer)	319
— — — — — foreign body in (N. Patterson)	79
— — — — — spasmodic stricture of (J. G. French)	37
Optic neuritis and ophthalmoplegia externa from sphenoidal disease (H. J. Davis)	33
— — — — — benefited by operation (H. Smith)	653
Orbital cellulitis after ethmoidal operation (A. J. M. Wright)	529
Ossiculectomy, value of (Hunter Tod)	109
Otic element of arctic whale (F. H. Westmacott)	416
Oto-laryngology, the teaching of (S. MacCuen Smith and discussion)	658
Otosclerosis (G. Brihl, O. Mayer)	294, 496
— — — — — histology of (O. Mayer)	497
— — — — — literature of (Froschels)	388
— — — — — pathology and situation of (G. Ferreri)	109
— — — — — traumatic (E. Ruttin)	316
Otology, retrospect of	20
Otorrhœa, <i>see</i> Ear, middle, suppuration of.	
Ouston (T. G.), obituary notice	560
Ovo-œsophago-gastric tube, permanent styletted (W. Hill)	307
Ozena, <i>see</i> Rhinitis, atrophic.	
Palate, deficiency of, congenital (W. Downie)	374
— — — — — deformity of, with displaced pituitary body (A. Tweedie)	80
— — — — — endothelioma of, treated with radium (J. G. French)	209
— — — — — epithelial pearls of, and tumours (Di Colo)	491
— — — — — epithelioma (?) of (W. Stuart Low)	83
— — — — — soft adeno-carcinoma of (Cornet)	384
— — — — — paralysis of (W. S. Syme)	431
— — — — — perforation of (W. J. Horne)	309
— — — — — nystagmus of (W. G. Porter)	44
Paraffin, injection of, for nasal deformity (W. Downie)	371
Parotid, cystic adenoma of (W. Stuart-Low)	82
Pemphigus (W. Watson-Williams)	528
Periotic bones of fossil Cetacea (W. J. Horne)	409
Peritonsillar abscess, death from (S. W. Prowse)	664
— — — — — fatal (Thomson)	326
Pharyngitis, lateral (Schubiger)	325
Pharyngoscope, Hay's improved (H. Tilley)	303
Pharynx, cancer of (M. Farquharson, P. R. W. de Santi)	47, 307
— — — — — cancer of deep (W. Hill)	44
— — — — — — — — — removal (A. Evans)	443
— — — — — cancer, party-wall (C. Graham)	77
— — — — — — surgery of (Custex)	490
— — — — — — treated by radium (M. Farquharson, Seanes Spicer)	47, 86
— — — — — disease of, unique (Frese)	665
— — — — — neoplasm of (W. H. Kelson)	213

	PAGE
"606," <i>see</i> Salvarsan.	
Salivary glands, diseases of (discussion)	476
Salvarsan (Benario, etc.)	499
— deafness after (O. Beck)	317, 608, 650
— — syphilitic, improved by (O. Beck)	316
— — effect upon labyrinth (G. Alexander, Benario, etc.)	359, 499 <i>et seq.</i>
— — in congenital syphilis (J. L. Bunch)	503
— — in diseases of larynx (G. Avellis)	501
— — in syphilis of nose (G. N. Biggs, Gerber, Safranek)	414, 502
— — instruments for injection of (Lieven)	86
— — Treatment of Syphilis by (review)	112
Scleroma, clinical aspect (Neumann)	488
— — distribution of (Ersäi, Schrötter)	488
Scottish Otological and Laryngological Society	44, 371, 424
Sea-sickness, causation of (Bárány)	157
Semicircular canals, <i>see</i> Canals, semicircular, and also Vestibular apparatus.	
Semon Lectureship in Laryngology	337
— — Sir Felix, memorial to	523
Septum nasi, <i>see</i> Nose, septum of.	
Singer's nodes, <i>see</i> Cords, vocal.	
Sinus frontal, endothelioma of (N. Maclay)	301
— — — intra-nasal drainage of (F. Ingals)	379
— — — puncture of (Sieur and Rouvillois)	438
— — — spongification of (Preysing)	549
— — — suppuration of: acute: conjunctival œdema (A. J. M. Wright).	530
— — — — Killian's operation for (J. S. Fraser, R. Fullerton, W. S. Syme)	47, 428, 430
— — — — treatment of (J. S. Barr, J. Moore, Stuart-Low, StClair Thomson, Weil, P. Watson-Williams (discussion)	354, 355, 356, 357, 376, 380
— — — — — with cerebral involvement (J. D. Lithgow)	45
— — — — — Watson-Williams operation (Watson-Williams)	526
— — — — — with extra-dural abscess (J. S. Fraser)	45
— — — — — with necrosis of frontal bone (W. Downie)	374
— — — — — surgery of (T. G. Gallaher)	656
— — — lateral, thrombosis of (J. G. Connal, J. Kerr Love, W. C. Nourse, J. W. Wood)	427, 426, 94, 253
— — — — — prostatic abscess (J. G. French)	520
— — — sigmoid, <i>see</i> Sinus, lateral.	
— — — sphenoidal, suppuration of, eye symptoms (H. J. Davis, G. F. C. Wallis)	33, 242
Sinuses, accessory, exostoses of (H. P. Mosher)	152
— — — disease of, and ocular symptoms (Baumgarten, L. A. Coffin, Cunningham, Frankenberger, StClair Thomson, G. F. C. Wallis, Watson-Williams)	160, 272, 242, 338, 439, 511
— — — — — suppuration of, and acute otitis media (Coakley)	558, 328
— — — — — in scarlet fever (T. Hubbard)	657
— — — — — brain, complications of (Onodi)	379
— — — — — treatment of (Hajek)	378
— — — — — vaccine treatment (Burkett and Meakins)	163
Sinusitis, anterior nasal visual fields in (G. F. C. Wallis)	511
Sixth cranial nerve, paralysis of, otitic (L. Leto)	616
Specialists, education of (C. M. Cobb)	278
Speziellen Chirurgie des Ohres, etc., Handbuch der (Drs. Katz, Preysing and Blumenfeld) (review)	503
Spheno-palatine ganglion, syndrome of neurosis of (G. Sluder)	151
Submucous resection, <i>see</i> Nose, septum of.	
Surdus in Search of his Hearing: An Exposure of Deafness Quacks (Evan Yellon) (review)	223

	PAGE
Syphilis, Treatment of, by the Ehrlich-Hata Remedy (review)	112
— <i>see also</i> Salvarsan.	
Syringo-bulbia affecting nose, etc. (A. B. Kelly)	424
Syringomyelia (Schrötter)	489
Tabes dorsalis, cranial nerves in (W. Williams)	559
Teeth, the, and diseases of mucous membranes (W. K. Sibley)	437
Telangiectasis of mouth, etc. (J. Safranek)	433
Temporal bone, types of fracture of (A. H. Cheate, G. J. Jenkins)	267
Temporal lobe, <i>see</i> Temporo-sphenoidal lobe.	
Temporo-sphenoidal lobe, abscess of, (Pommerehne)	669
— — — — — operation, patient twenty-four years after (T. Barr)	371
— — — — — with rare eye symptoms (Barek)	497
— — — — — and frontal lobe abscess (P. Watson-Williams)	423
— — — — — tumour of, misleading symptoms (Ruttin)	609
Thrombo-kinase, hæmostatic (L. W. Strong),	569
Thyro-fissure, <i>see</i> Thyrotomy.	
Thyro-lingual cyst, removal of, acute thyroidism (H. J. Davis)	33
Thyroid cartilage, wounds of, cicatrization of (Strazza)	147
— — — gland, diseases of, and the upper respiratory tract (R. S. Burt)	558
— — — — — suppuration of (I. Bahri)	558
— — — — — lingual (G. W. Badgerow, Bertein and Gelle)	142, 550
— — — — — (H. F. Smyth)	666
Thyrotomy, cicatrization after (Strazza)	147
— — — — — for papilloma (F. R. Packard, W. Downie)	323, 373
Tobacco deafness (Reik)	390
Tongue, black (C. H. Knight)	324
Tonsil, cancer of, cured by operation (M. H. Richardson)	665
— — — — — sarcoma of, in a child (L. C. Cline)	665
Tonsils, enucleation of (J. S. Fraser)	663
— — — — — faucial, cancer of (P. R. W. de Santi)	307
— — — — — — — — — primary (E. A. Peters)	439
— — — — — — — — — galvano-cautery for (O. Levinstein)	664
— — — — — — — — — cyst of (W. H. Kelson)	309
— — — — — — — — — disease of, doubtful diagnosis (S. Hastings)	437
— — — — — — — — — enucleation of, <i>see</i> Tonsillectomy.	
— — — — — — — — — evisceration of (C. G. L. Wood)	452
— — — — — — — — — improved Mackenzie guillotine for (H. E. Jones)	335
— — — — — — — — — lympho-sarcoma of (C. F. Theisen)	317
— — — — — — — — — operations on, choice of (G. A. Crockett)	326
— — — — — — — — — removal of: emphysema of neck after (B. D. Parish)	275
— — — — — — — — — — — — — followed by Basedow's disease (C. J. König)	275
— — — — — — — — — — — — — tuberculosis of (C. Graham, F. Rose)	136, 435
— — — — — — — — — — — — — ulceration of (L. H. Pegler)	439
— — — — — — — — — — — — — wounds of, bacteriology (A. W. MacCoy)	274
— — — — — pharyngeal, <i>see</i> Adenoids.	
Tonsillectomy (H. Arrowsmith, Blegvad, Freedman, K. Kofler)	390, 326, 495, 325
— — — — — hæmorrhage after (H. A. Barnes)	274
Tonsillitis due to <i>Bacillus coli</i> (C. B. Faunce)	494
Tonsillolith (C. A. Parker)	36
Trachea, fatal pressure on, by tumour (C. G. Coakley)	322
— — — — — foreign body in (Clark and Richardson)	276
— — — — — — — — — gumma of, death from (McCardie)	329
— — — — — — — — — stenosis of, dilatation (P. Laurens)	485
Tracheo-bronchoscopy (S. H. Large)	330
Tracheo-laryngostomy for stenosis (W. Hill)	304
Trauma in relation to otology (discussion)	258
Treatment of Syphilis by the Ehrlich-Hata Remedy, The (Dr. J. Bressler) (review)	112

	PAGE
Turbinal bone, middle: cyst of (H. Gaudier, P. Watson-Williams)	493, 529
Turbinated bodies and sinuses, function of (J. Adam)	288
— — — hypertrophy of, treated by electrolysis (M. Bresgen)	268
Tympanum, <i>see</i> Ear, middle.	
Typhoid deafness (P. Manasse)	111
— — — laryngitis (M. Faunz)	433
Urea-hydrochlorate and quinine as local anæsthetic (E. F. Ingals)	106
Uvula, pedunculated growth on (H. Tilley)	
Vaccine treatment (discussion)	318
— — — of accessory sinusitis (Burkett and Meakens)	163
— — — of middle-ear suppuration (Kopetsky)	164
— — — of pyorrhœa alveolaris (Williams)	552
— — — of scarlatinal rhinitis (Kolmer and Weston)	662
Vertigo, acute, case of (H. J. Davis)	199
— — — labyrinthine, non-infective, operation for (G. J. Jenkins)	411
— — — researches (von Stein)	445
— — — treated through Eustachian tube (E. M. Holmes)	668
Vestibular apparatus damaged by salvarsan (O. Beck)	316, 317
— — — effect of salvarsan upon (G. Alexander)	389
— — — <i>See also</i> Neuro-recurrence.	
— — — hyper-activity of, in tumour (Urbantschitsch)	609
— — — relationship with cerebellum (R. Bárány)	393
Vestibular reactions, effects of removal of parts of brain upon (Bauer and Leidler)	669
— — — peculiar (Neumann)	159
— — — varying (E. Urbantschitsch)	608
— — — <i>See also</i> Nystagmus, vestibular, and Canals, semicircular.	
Vision, impairment of, from intra-nasal disease (E. Baumgarten)	160
Visual fields in anterior nasal sinusitis (G. F. C. Wallis)	511
— — — in sphenoid and ethmoid sinusitis (G. F. C. Wallis)	242
— — — <i>See also</i> Ocular symptoms, etc.	
Voice, The Abuse of the Singing and Speaking, etc. (E. J. Moure and E. Boyer, Fils, (review)	279
— — — <i>See also</i> Phonetics.	
Wire saw in radical mastoid (V. S. Stein)	123
X-rays, <i>see</i> Radiography.	

AUTHORS.

ADAM (James), atrophic rhinitis	377
— hearing after mastoid operation	377
— oedema of face	377
— polypi from inferior turbinals	378
— turbinal and sinus function	288
ALEXANDER (G.), labyrinth surgery	556
— — — salvarsan	389
ARROWSMITH (H.), septal papilloma	440
— — — tonsil enucleation	390
AVELLIS (Georg), salvarsan	501
BADGEROW (Geo. W.), lingual thyroid	142
BAHRI (Ismet), thyroiditis	558
BALLANCE (C. A.), injuries of ear	260
BALLENGER (W. L.), antrum operation	153
BÁRÁNY, alcohol intoxication	652
— — — (Robt.), cerebellar abscess	313

	Page
BÄRÄNY (Robt.), cerebellum and vestibular apparatus	393
— labyrinth fistula	327
— sea-sickness	115
— tests for cerebellar function	444
— trauma of cerebellum	314
BARCK, brain abscess	497
BARDES (A.), prevention of ear disease	277
BARIL (G.), regional anæsthesia	663
BARNES (H. A.), tonsillotomy	274
BARR (J. Stoddart), cerebellar abscess	375
— ethmoidal cancer	376
— frontal sinus operation	376
BARR (Thos.), temporo-sphenoidal abscess	371
BARTON, hexamethylenamine	278
BAUER (J.), and LEIDLER (R.), vestibular reflexes	669
BAUMGARTEN, early ozaena	270
BAUMGARTEN (E.), impairment of vision, etc.	160, 612
BECK (J. C.), mastoid operations	217
— — — salivary glands	478
BECK (Oscar), deafness after salvarsan	650
— — — multiple sclerosis	249
— — — salvarsan	316, 317, 608
BERTHEIN (P.), and GELLÉ (E.), lingual thyroids	559
BENARIO, neuro-recurrence after salvarsan	499
BIGGS (G. N.), leprosy	414
— — — salvarsan	414
BLACK (N. M.), nasal stenosis	328
BLEGVAD, tonsillectomy	326
BLUMENFELD (Felix), laryngeal cancer	442
BLUMFELD (J.), nasal reflex	493
BONAIN, incubation	486
BONDY, labyrinthitis	454
BOURACK, adenoid operations	495, 544, 614
BRESGEN (M.), electrolysis	268
BRINDEL, synechia of nose	481
BRONNER (Adolph), faucial fibroma	36
BROWN (Clayton M.), radical mastoid	447
BROWN (G. V. J.), maxillary readjustment	328
BROWN (W. Langdon), rectal feeding	559
BRÜHL (Gustave), otosclerosis	294
BRYANT (W. Sobier), epidemic poliomyelitis	275
— — reflex neuroses	390
BUCKLIN (C. A.), pulmonary tuberculosis, etc.	455
BUNCH (J. S.), salvarsan	503
BURKETT (H. S.), and MEAKINS (J. C.), vaccine treatment	163
BURT (Shurley R.), thyroid gland	558
CARTER (W. W.), laryngeal papilloma	442
— — transplantation of bone, etc.	441
CASSELBERRY (W. E.), bronchoscopy	319
CASTEX, pharyngeal cancer	490
CATHCART (E. C.), acute mastoiditis	95
— — — papilloma of pharynx	85
— — — recurrent aphonia	142
— — — ulceration of vocal cord	85
CHAMBERLAIN (W. B.), naso-pharyngeal fibroma	549
— — — non-suppurative ethmoiditis	50
CHEATLE (A. H.), diploëtic mastoids	408
— — — erysipelas of external meatus	497
— — — exostosis	93
— — — fractures of temporal bone	267

	PAGE
CHEATLE (A. H.), and JENKINS (G. J.), exposed posterior semicircular canal	92
CHIARI, ethmoidal fibroma	151
CITELLI, adenoids and the hypophysis	544
— intubation	441
CLAOUÉ (R.), papilloma of larynx	386
— laryngeal tuberculosis	486
CLARK (J. P.), maxillary antrum disease	50
— and RICHARDSON (O.), foreign body in trachea	276
CLINE (L. C.), sarcoma of tonsil	665
COAKLEY (C. G.) mediastinal tumour	322
— sinus suppuration, etc.	328, 558
COBB (C. M.), education of specialists	278
COLO (Di) palatal tumours	491
CONNAL (J. Galbraith), exostosis of ear	426
— lateral sinus thrombosis	427
COFFIN (L. A.), sinusitis and eye symptoms	272
CORNET, epithelioma of palate	384
CROCKETT (E. A.), tonsil operations	326
CUNNINGHAM (H. H.), nose and eye	338
CURTIL, arytenoid abscess	329
DAVID, high frequency	546
DAVIS (H. J.), extra-dural abscess	199
— mastoiditis	198
— maxillary antrum suppuration in childhood	35
— nasal leprosy	31
— naso-pharyngeal polypus	36
— sarcoma of antrum	34, 145
— thyro-lingual cyst	33
— vertigo	199
DE SANTI (P. R. W.), cancer of pharynx	397
DELAYAN (D. B.), motor-car	154
DENCKER (H.), foreign body in larynx	443
DESNEUX and DUJARDIN, neuro-recurrence after salvarsan	590
DONELAN (J.), nasal speculum	504
— swelling of vocal cord	140
DORTU (P.), cerebellar abscess	669
DOWNIE (Walker), bilateral abductor paralysis	373
— congenital deficiency of palate	374
DOWNIE (Walker), ethmoidal sarcoma	372
— naso-pharyngeal polypus	372
— necrosis of frontal bone	374
— paraffin injections	371
— subglottic papilloma	373
DIVERGIE (J.) and BAIN (A.), sporotrichosis	438
EVANS (Arthur), pharyngeal cancer	443
EVANS (J. Howell), congenital auricular tumours	53
FABRI (E.), iodo-thiosinamine	440
FARACCI, tuberculosis	491
FARQUHARSON (Malcolm), choanal polypus	48
— cerebro-spinal rhinorrhœa	47
— epithelioma of pharynx	47
— lupus of nose	47
— papilloma of larynx	48
— paralysis of acoustic nerve	47
FAULDER (T. Jefferson), chronic laryngitis	42
FAUNCE (C. B.), colon bacillus tonsillitis	494
FEIN, resection of septum	491

	PAGE
FERRERI (Gherardo), otosclerosis	169
FETTEROLF and NORRIS, recurrent paralysis	552
FINZI and HOPE (C. W. M.), œsophagoscopy and radium	525
FLATAU (T. S.), singers' nodes	553
FOURNIE, cancer of larynx	218
FRANKENBERGER (O.), ocular disturbances, etc.	139
FRASER (J. S.), enucleation of tonsils	663
— frontal sinusitis, extra-dural abscess	45
— — Killian's operation	47
— purulent labyrinthitis	46
— — — and REYNOLDS (F. E.), ozæna	169
FRAZER (J. E.), development of Eustachian tube	53
FREEDMAN, tonsillectomy	495
FREER (O.), antral sarcoma	140
FRENCH (J. Gay), endothelioma of palate	209
— — — lateral sinus thrombosis	520
— — — œsophageal stricture	37
FRESE (Prof.), unique disease of mouth	665
FREUDENTHAL (Wolff), asthma	537
— — — intra-cranial complications	379
— — — radium	611
FREY (H.), chronic adhesive processes of middle ear	633
FROESCHELS, otosclerosis	388
GALLAHER (T. G.), frontal sinus operation	656
GARDNER (W. T.), statistical tables	111
GAUDIER (H.), middle turbinal cyst	493
— — — and GUGGENHEIM (H.), salvarsan	501
GERBER, salvarsan	502
GILL (Richard), retro-pharyngeal abscess	384
GOODALE (J. L.), influenza	165
GÖRKE (Max), labyrinthitis	398
GRAHAM (Cecil), pharyngeal cancer	77
— — — tonsillar tuberculosis	136
GRAHAM (H. B.), acute otitis	498
GRANT (Dundas), laryngeal tuberculosis	561
— — — Prof. Lucæ	281
— — — (reviews)	54, 55, 56, 112, 167, 223, 278, 279, 332, 448, 503
GRAYSON (C. P.), neurasthenia	101
GRAZZI (V.), hearing of railway employes	668
GREEN (D. Crosby), bronchoscopy	276
— — — transplantation of rib, etc.	273
GROSSARD and KAUFMANN, adenoidectomy	383
GROSSMANN, nasal asthma	268
GUGGENHEIM (L. K.), vestibular nystagmus	388
GUTBERLET (W.), nasal irrigator	276
GUTHRIE (Thos.), cancer of naso-pharynx	449
GUYOT (F.), anaesthesia for adenoids	614
HAJEK, sinus suppuration	378
— — — and POLYAK, nasal myxoma	150
HALÁSZ (H.), extra-dural abscess	498
HALLE (Max), alæ nasi	348
HARPER (Jas.), latent labyrinthitis	553
HASKIN (W. H.), suppuration of middle ear	498
HASTINGS (Somerville), burr for nasal antrostomy	217
— — — myasthenia gravis	40
— — — tonsillar disease	137
HEATH (C. J.), mastoid operation	417
HELD (R. Johnson), salivary glands	476
HETT (G. Seccombe), laryngeal tuberculosis	582

	PAGE
HILL (Wm.), cancer of œsophagus	43, 307
— - cancer of pharynx	44
— - nasal tuberculosis	145
— - œsophagoscope with expanding blades	82
— - œsophago-gastroscopy	82, 134, 307
— - tracheo-laryngostomy	304
— — and HERSCHELL (G.), œsophago-gastroscopy	525
HINTZE (K.), labyrinth syphilis	616
HOBDAY (F.), ventricle-stripping, etc.	205
HOFFMANN (R.), maxillary cysts	550
HOLMES (E. M.), cure of vertigo	668
— — - naso-pharyngoscope	494
HONEIJ, common colds	492
HORNE (W. Jobson), aphonia	217
— - fossil periotic bones	409
— - insufflator	309
— - neoplasm of nose	309
— - perforation of soft palate	309
— - tuberculosis of larynx	309
HORSFORD (C.), laryngeal tuberculosis	43
HOWARTH (Walter), chronic laryngitis	304
HUBBARD (Thos.), scarlatinal sinus suppuration	657
HUNT (J. Ramsay), poliomyelitis, etc.	165
INGALS (E. Fletcher), direct laryngoscope	536
— - frontal sinusitis	379
— — - local anæsthesia	106, 278
INGERSOLL, syphilitic pharyngeal stenosis	273
IRSAL, scleroma	488
JACQUES and BERTEMES, fibrous polypus	483
JAY (Melville), asthma	493
JENKINS (G. J.), fractures of temporal bone	267
— - Ménière's syndrome, operation	411
— — - and CHEATLE (A. H.), exposed posterior semicircular canal	92
JONES (H. E.), tonsil guillotine	335
JQUTY, laryngeal tuberculosis	490
KAHLER, atrial neoplasms	489
KATZENSTEIN, phonation centres	548
KEITH (Prof.), remarks on displaced pituitary	80
KELLY (A. Brown), myasthenia gravis	425
— - syringobulbia	424
KELSON (W. H.), lupus of larynx	37
— - neoplasm of pharynx	213
— - neoplasm of tympanum	204
— - polypus of naso-pharynx	84
— - tonsillar cyst	309
KERRISON (Philip D.), purulent labyrinthitis	553
KNIGHT (C. H.), black tongue	324
KOENIG (C. J.), singers' nodes	330
— - tonsillotomy, etc.	275
KOFFLER (Karl), tonsillectomy	326
KOLMER and WESTON, scarlatinal rhinitis	662
KOPETSKY (S. J.), labyrinth surgery	498
— - vaccine therapy in otitis	164
KYLE (J. J.), ear symptoms in general disease	112
LABOURE (J.), adenoids	614
LACK (H. Lambert), lupus erythematosus of mouth	217
LANG, choanal polypus	492

	PAGE
LANNOIS and JOCOD, ozematous otitis	331
LARGE (Seccord H.), tracheoscopy, etc.	330
LAUTMANN, adenoid operation	382, 552
" nasal syphilis	191
LAURENS (P.), tracheal stenosis	185
LAW (E.), epithelioma of naso-pharynx	196
LETO (L.), paralysis of sixth nerve	616
LEVINSTEIN (O.), chronic tonsillitis	664
" recurrent paralysis	196
LIEVEN, salvarsan	86
LITHGOW (J. D.), frontal sinusitis	15
LOGAN (J. E.), President's Address	101
LOVE (A.), diphtheritic paralysis	665
LOVE (J. Kerr), education of the deaf	132
" lateral sinus thrombosis	126
LÖWE (Ludwig), nasal surgery	662
McCARDIE (W. J.), tracheal gumma	329
MACCOY (A. W.), tonsil operation	274
MACDONALD (A. G.), diphtheria carriers	384
MACKENNA (R. W.), ionic medication	611
McKEEN (S. F.), death following diphtheria antitoxin	665
McKENZIE (Dan), blocking of nasal duct	215
" laryngeal papilloma	141
" obliteration of naso-pharynx	216
(review)	223
" unilateral deafness	97
MACLAY (Neil), endothelioma of frontal bone	391
MAHU (Georges), partial mastoid operation	1
MANASSE (P.), typhoid deafness	111
MARSCHICK, laryngeal cancer	189
MATHEWSON (G. H.), mastoiditis	54
MAYER (Emil), oesophageal diverticula	319
MAYER (O.), otosclerosis	496
MEAKINS (J. C.), and BURKETT (H. S.), vaccine treatment	163
MERRILL (W. H.), diabetic deafness	616
METZENBAUM (M.), submucous resection	410
MEYER (A.), adenoids	637
MILLIGAN (W.), cerebellar abscess	87, 88
" injuries of external and middle ear	258
labyrinth fistula	90
labyrinth operation	89
MIGNON, spasmodic rhinitis	182
MOORE (Irwin), frontal sinusitis	355
MOSHER (H. P.), intubation of larynx	152
" sinus exostosis	152
MOURE, cancer of nose	190
" laryngeal cancer	185
" naso-pharyngeal polypus	483
MOURET, dehiscences of ear, etc.	158
MUECKE (F. F.), aphonia	217
MYLES (Robert C.), salivary glands	177
NATIER (Marcel), ozema	324
NEUMANN, deafness for conversation	159
" scleroma	188
NOON (L.), hay-fever	611
NOURSE (W. Chichele), lateral sinus thrombosis	94
NUERNBERG (F.), rupture of carotid	551
O'MEARA (J. M.), adenoids	613

	PAGE
OFFICER (D. McM.), septal deviation	610
ONODI (A.), embryonic cysts	434
— exposure of brain, etc.	435
— intra-cranial complications	379
— recessus frontalis	434
OPPIKOFER (E.), gangrene of larynx, etc.	667
OUSTON (T. G.), radium	505
PACKARD (F. R.), laryngeal papilloma	323
PAGE (J. R.), reflex neuroses	390
PALLEINE (Robert), nasal obstruction	549
PARISH (B. D.), subcutaneous emphysema, etc.	275
PARKER (Chas. A.), tonsillolith	36
PATTERSON (Norman), epiglottic cancer	143
— denture in œsophagus	79
— nasal chancre	142
PAUNZ (M.), typhoid laryngitis	433
PEGLER (L. H.), aphonia in a boy	308
— cancer of larynx	139
— laryngeal tuberculosis	137, 215
— party-wall cancer	214
— pharyngeal ulceration	139, 214
PETERS (E. A.), nodules of vocal cord	41
— tonsillar cancer	139
PHILIP, osteoma of antrum	483
— dentigerous cyst	272
PIERCE (N. H.), surgery of pituitary	271
PINDER (T. H.), submucous resection	168
POMMERHNE (F.), temporo-sphenoidal abscess	669
PORTER (W. G.), labyrinthotomy	44
— nystagmus of cord	44
POWELL (Fitzgerald), laryngeal neoplasm	144
PREYSING, spongification of frontal sinus	549
PRICE-BROWN (J.), cancer of nose, etc.	325
PROTA (G.), pharyngeal occlusion	437
PROWSE (S. W.), fatal quinsy	664
REIK (H. O.), mastoid operation	332
— tobacco	390
REYNOLDS (F. E.), and FRASER (J. S.), ozæma	169
— and TURNER (A. Logan), mastoid suppuration	57
RICHARDS (G. L.), silver nitrate in middle-ear suppuration	53
RICHARDSON (C. W.), epithelioma of larynx	320
RICHARDSON (M. H.), cancer of tonsil	665
ROSE (Frank), tuberculous tonsillitis	135
RUDLOFF (W.), extra-dural abscess	164
RUPPRECHT, tonsils and adenoids	544
RUTTIN (E.), labyrinthitis	314
— mucous otitis	156
— meningitis	156
— otitic meningitis	315
— otosclerosis	316
— rotation nystagmus	609
— temporo-sphenoidal tumour	609
SAFRANEK (J.), laryngeal lupus	434
— telangiectasis	433
SCHAEFFER (J. P.), development of nose	662
— maxillary antrum	327
SCHAMBERG (J. F.), epidemic chancre of lip	670
SCHMIEGELOW (E.), laryngeal cancer	52

	PAGE
SCHRÖTTER, scleroma	488
—— syringomyelia	489
SCHUBIGER, lateral pharyngitis	325
SCOTT (Sydney), fistula of labyrinth, etc.	291
SEWELL (Lindley), deafness from mumps	557
—— labyrinth fistula	54
SHAMBAUGH (G. E.), blood-vessels of nose, etc.	165
—— tone-perception	387
SHEARER (D. F.), noise machine	553
SHURLY (B. R.), intubation	386
SIBLEY (W. Knowsley), teeth, etc.	437
SIEMS, atrophic rhinitis	487
SIEUR and ROUVILLOIS, anaesthesia of larynx	615
—— ——— frontal sinus	438
—— ——— laryngostomy	184
SLUDER (G.), spheno-palatine ganglion	151
SMITH (Harmon), laryngeal syphilis	321
—— optic neuritis	653
SMITH (S. MacCuen), teaching of oto-laryngology	658
SMYTH (H. F.), lingual thyroid	666
SPICER (Seanes), cancer of pharynx	86
—— rigid resistances of larynx	25
STEIN (von), autokinesis, etc.	445
STEIN (V. Saxtorph), wire-saw	123
STENGER, trauma of internal ear	110
STEPINSKI, lactic acid	165
STRAZZA, wounds of thyroid cartilage	117
STRONG (L. W.), thrombo-kinase	560
STUART LOW (W.), cancer of nose	50
—— cystic adenoma of parotid	82
—— epithelioma of palate	83
—— frontal sinusitis	356
SYME (W. S.), anaesthesia of palate, etc.	431
—— frontal sinus operation	430
—— sarcoma of nose	429
SYTSCHOW (K.), laryngeal tuberculosis	615
TAPTAS, M. W. (rhinitis caseosa)	408
THEISEN (C. F.), lympho-sarcoma of pharynx	317
THEOBALD (S.), reflex aural neuroses	165
THOMPSON (J. A.), bony ethmoidal cyst	611
THOMSON (J. J.), quinsy, fatal	326
THOMSON (StChair), frontal sinusitis	354
—— laryngeal epithelioma, stenosis	310
—— nose and eye	531
THOST, laryngeal stenosis	116
TIEFENTHAL, operation on jugular bulb	555
TILLEY (H.), bronchiectasis from foreign body	211
—— bronchoscopy	525
—— malformation of upper jaw	137
—— nasal chisel	31
—— pharyngoscope	303
—— tooth in maxillary antrum	213
—— uvular neoplasm	303
TOD (Hunter F.), ossiculectomy	109
TRATMAN (Frank), fibroma of larynx	667
TUNIS (J. P.), leukaemia, nasal abscesses	385
TURNER (Logan), laryngeal tuberculosis	48
—— meningitis, recovery	49
—— Reports of Ear and Throat Department	111
—— review	503

	PAGE
TURNER (Logan), tumour of nasal vestibule	48
—— and REYNOLDS (F. E.), mastoid suppuration	57
TWEEDIE (Alex. R.), displaced pituitary	80
UCHERMANN (V.), laryngeal stenosis	145
URBANTSCHITSCH (E.), auditory nerve tumour	609
—— vestibular reactions	608
VEIS (J.), rupture of membrana tympani	163
WALLIS (G. F. C.), visual fields in sinusitis	242, 511
WALTER (W.), bacteriology of rhinitis	50
WALTERS (C. F.), and FINZI (N. S.), tumour of cheek	530
WATSON-WILLIAMS (P.), bronchoscopy	525
—— cystic middle turbinal	529
—— frontal sinusitis	357
—— epithelioma of larynx	208, 526
—— glossitis	529
—— laryngeal tuberculosis	574
—— cesophageal stricture	143
—— otitic brain abscess	423
—— pemphigus	528
—— pharyngeal syphilis	529
—— radical frontal sinus operation	526
—— (reviews)	334, 671
—— upper air-tract and respiration	617
—— HOPE (C.), and FINZI (N. S.), radium	525
WEIL (Arthur J.), accessory sinus disease	380
—— acute otitis	667
WELLS (W. A.), naso-pharyngeal polypus	539
WELTY (Cullen F.), Thiersch graft	282
WEST (Baltimore), resection of nasal duct	328
WEST (C. E.), post-nasal catarrh	98
WESTMACOTT (F. H.), cholesteatoma	416
—— ear of whale	416
—— necrosis of labyrinth	416
WILLIAMS, pyorrhea alveolaris	552
WILLIAMS (Washington), tabes dorsalis	559
WILSON (J. G.), comparative anatomy of larynx	103, 386
WOOD (C. G. Russ), evisceration of tonsils	452
WOOD (J. Walker), lateral sinus thrombosis	253
WOODS (R. H.), disappearance of cancer	495
WRIGHT (A. J. M.), acute frontal sinusitis	530
—— case for diagnosis	78
—— orbital cellulitis	529
—— paralysis of third nerve	503
YEARSLEY (P. Macleod), adenoids in school children	51
—— chronic adhesive processes of middle ear	626
—— fibrolysin in otology	225
—— (review)	391
—— Rosenmüller's fossa	331
ZIEM (C.), injuries of the head, etc.	127
ZWAARDEMAKER and BOUMANN, phonetics	545



